# X9DRD-EF

## USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

Release Date: July 26, 2012

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# Preface

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the X9DRD-EF motherboard.

## About This Motherboard

The Super X9DRD-EF motherboard supports dual Intel E5-2600 (Socket R) Series Processors that offer QPI (Intel QuickPath Interface) Technology (V.1.1), providing point-to-point connection with a transfer speed of up to 8.0 TG/s. With the C602J built in, the X9DRD-EF motherboard supports Intel® Manageability Engine (ME), Rapid Storage Technology, Digital Media Interface (DMI), PCI-E Gen. 3.0 and 1600 MHz DDR3 memory. This motherboard is ideal for high-end server platforms. Please refer to our website (http://www.supermicro.com) for CPU and memory support updates.

## Manual Organization

**Chapter 1** describes the features, specifications and performance of the motherboard. It also provides detailed information about the Intel C602J chipset.

**Chapter 2** provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory, and system setup stored in CMOS.

**Chapter 4** includes an introduction to BIOS, and provides detailed information on running the CMOS Setup utility.

**Appendix A** provides BIOS Error Beep Codes.

**Appendix B** lists Software Installation Instructions**.**

## Conventions Used in the Manual

Pay special attention to the following symbols for proper system installation and to prevent damage to the system or injury to yourself:

**Danger/Caution:** Instructions to be strictly followed to prevent catastrophic system failure or to avoid bodily injury

**Warning:** Important information given to ensure proper system installation or to prevent damage to the components

**Note:** Additional information given to differentiate between various models or provides information for correct system setup.

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# Chapter 1

# Overview

## 1-1 Overview

### Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Please check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

The following items are included in the retail box.

- One (1) Supermicro Mainboard
- Six (6) Serial ATA cables (CBL-0044Lx6)
- One (1) I/O Shield (MCP-260-00042-0N)

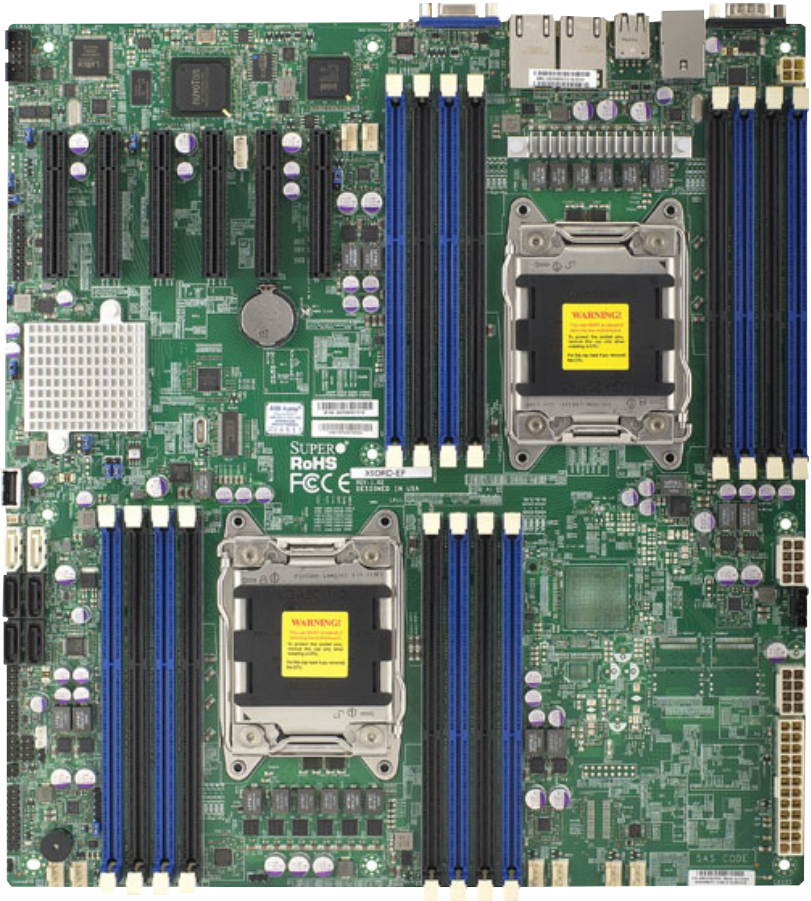
**Note:** For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your motherboard.

SMCI product mauals: http://www.supermicro.com/support/manuals/

Product Drivers and utilities: ftp://ftp.supermicro.com/

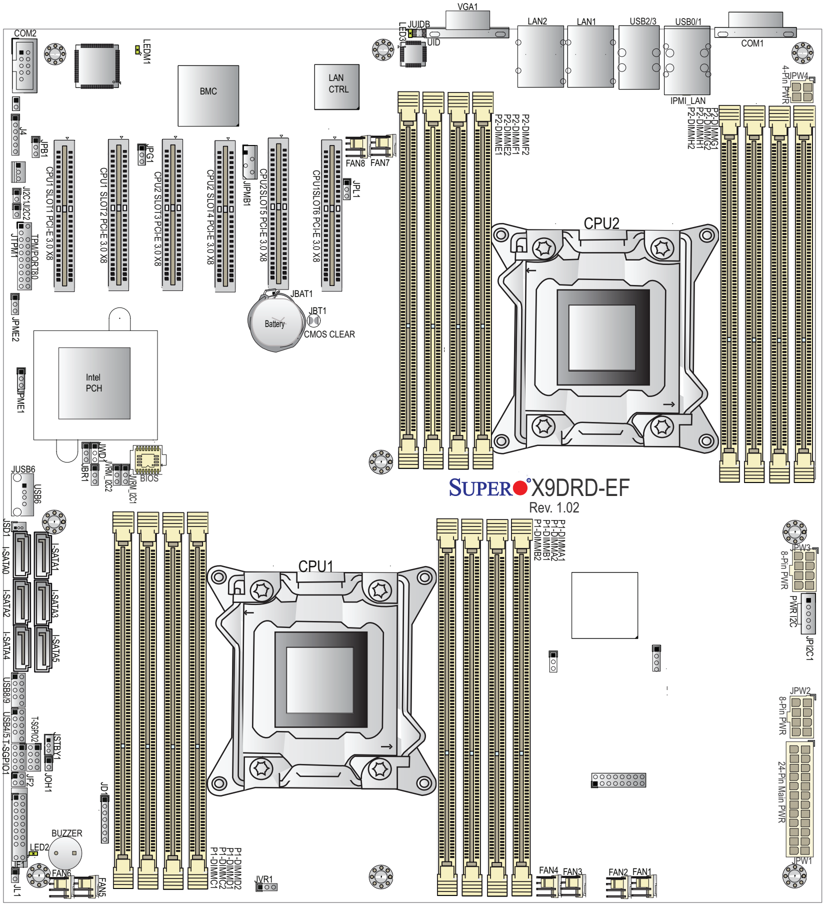
If you have any questions, please contact our support team at support@supermicro.com.

## SUPERMICRO Motherboard Image



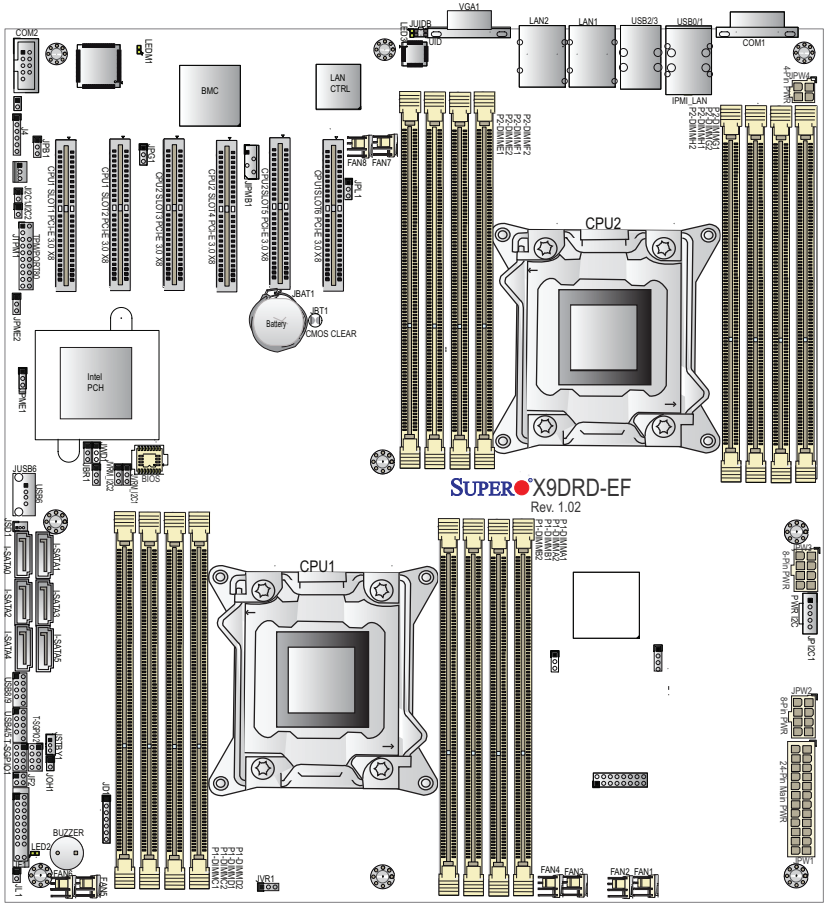

**Note**: All graphics shown in this manual were based upon the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.

## Motherboard Layout


VGA1
JUIDB
LED3
UID
LAN2
LAN1
USB2/3
USB0/1
COM1
COM2
LEDM1
BMC
LAN CTRL
IPMI_LAN
4-Pin PWR
JPW4
P2-DIMMF2
P2-DIMMF1
P2-DIMME2
P2-DIMME1
P2-DIMMG1
P2-DIMMG2
P2-DIMMH1
P2-DIMMH2
J4
JPB1
JPG1
CPU1 SLOT1 PCI-E 3.0 X8
CPU1 SLOT2 PCI-E 3.0 X8
CPU2 SLOT3 PCI-E 3.0 X8
CPU2 SLOT4 PCI-E 3.0 X8
CPU2SLOT5 PCI-E 3.0 X8
CPU1SLOT6 PCI-E 3.0 X8
JIPMB1
FAN8
FAN7
JPL1
JI2C1
JI2C2
JTPM1
TPM/PORT80
JBAT1
JBT1
Battery
CMOS CLEAR
CPU2
JPME2
Intel PCH
JPME1
JWD1
JBR1
JVRM_I2C2
JVRM_I2C1
BIOS
JUSB6
USB6
SUPER X9DRD-EF
Rev. 1.02
P1-DIMMA1
P1-DIMMA2
P1-DIMMB1
P1-DIMMB2
JPW3
8-Pin PWR
PWR I2C
JPI2C1
JSD1
I-SATA0
I-SATA1
I-SATA2
I-SATA3
I-SATA4
I-SATA5
CPU1
USB8/9
USB4/5
T-SGPIO1
T-SGPIO2
JSTBY1
JOH1
JF2
JD1
JPW2
8-Pin PWR
24-Pin Main PWR
BUZZER
LED2
JF1
JL1
FAN6
FAN5
P1-DIMMD2
P1-DIMMD1
P1-DIMMC2
P1-DIMMC1
JVR1
FAN4
FAN3
FAN2
FAN1
JPW1

**Note:** For the latest CPU/Memory updates, please refer to our website at http://www.supermicro.com/products/motherboard/ for details.

## X9DRD-EF Quick Reference




**Notes:**

- See Chapter 2 for detailed information on jumpers, I/O ports and JF1 front panel connections. "■" indicates the location of "Pin 1".
- Jumpers/LED Indicators not indicated are for testing only. Also, components that are not documented in this manual are reserved for internal use only.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

**X9DRD-EF Jumpers**

| Jumper | Description | Default Setting |
|---|---|---|
| JBT1 | Clear CMOS | See Chapter 3 |
| JI²C1/JI²C2 | SMB to PCI-E Slots | Open (Disabled) |
| JPB1 | BMC Enabled | Pins 1-2 (Enabled) |
| JPG1 | VGA Enabled | Pins 1-2 (Enabled) |
| JPL1 | GLAN1/GLAN2 Enable | Pins 1-2 (Enabled) |
| JWD1 | Watch Dog Timer Enable | Pins 1-2 (Reset) |

**X9DRD-EF Connectors**

| Connectors | Description |
|---|---|
| COM1/COM2 | Backplane COM Port1/Front Accessible COM2 Header |
| FAN1~8 | CPU/System Fan Headers |
| JBAT1 | Onboard Battery (See Chpt. 3 for Used Battery Disposal) |
| JD1 | Speaker/Power LED Indicator |
| JF1 | Front Panel Control Header |
| JIPMB1 | 4-pin External BMC I²C Header (for an IPMI Card) |
| JL1 | Chassis Intrusion |
| JOH1 | Overheat LED Indicator |
| JPI²C1 | Power Supply SMBbus I²C Header |
| JPW1 | 24-Pin ATX Main Power Connector (Warning on Pg. 1-6.) |
| JPW2/3 | 12V 8-Pin Power Connectors (See Warning on Pg. 1-6.) |
| JPW4 | 12V 4-Pin Power Connectors (See Warning on Pg. 1-6.) |
| JSD1 | SATA DOM (Device on Module) Power Connector |
| JSTBY1 | +5V Standby Power Header |
| JTPM1 | TPM (Trusted Platform Module)/Port 80 |
| JUID | UID (Unit Identification) Switch |
| LAN1/LAN2 | Gigabit Ethernet Ports 1/2 |
| (IPMI) LAN | IPMI_Dedicated LAN |
| (I)SATA0-5 | Intel SATA Connectors 0-5 from the Intel PCH |
| SP1 | Onboard Buzzer (Internal Speaker) |
| (CPU1)Slots1/2/6, (CPU2)Slot3/4/5 | PCI-Express 3.0 x8 Slots (See Note Below) |
| (T-)SGPIO 1/2 | Serial ATA (SATA) General Purpose I/O Header |
| (BP) USB 0/1, 2/3 | Back Panel USB 0/1, 2/3 |
| (FP) USB 4/5, USB 8/9 | Front Panel Accessible USB Connections (4/5, 8/9) |

**Note:** PCI-E slots support Low-Profile MD2 form factor for devices/add-on cards that are shorter than 167.64mm or 6.59" (in) in length only.

| | |
|---|---|
| (FP) USB 6 | Type A USB Embedded Drive Connector |
| VGA | Backpanel VGA Port |

**X9DRD-EF LED Indicators**

| LED | Description | State | Status |
|---|---|---|---|
| LED2 | Standby PWR LED | Green: On | Standby PWR On |
| LED3 | Rear UID LED | Blue: On | Unit Identified |
| LEDM1 | BMC Heartbeat LED | Green: Blinking | BMC Normal |

**Warning!**

To prevent damage to the power supply or the motherboard, please use a power supply that contains a 24-pin, a 4-pin, and two 8-pin power connectors. Be sure to connect the power supply to the 24-pin power connector (JPW1), and the two 8-pin power connectors (JPW2/3) on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

## Motherboard Features

| | | |
|---|---|---|
| **CPU** | • Dual Intel® E5-2600 Series (Socket R-LGA 2011) processors; each processor supports two full-width Intel QuickPath Interconnect (QPI) links (with support of up to 25.6 GT/s per QPI link and with Data Transfer Rate of up to 8.0 GT/s per direction) | |
| **Memory** | • Integrated memory controller supports of up to 512 GB of 240-pin Registered (RDIMM)/Load Reduced (LRDIMM) ECC or Unbuffered (UDIMM) ECC/Non-ECC DDR3 800/1066/1333/1600 MHz memory modules in 4-channel 16 DIMM modules<br>**Note**: For the latest CPU/memory updates, please refer to our website at http://www.supermicro.com/products/motherboard. | |
| | **DIMM sizes** | |
| | • RDIMM | 1GB, 2GB, 4GB, 8GB,16GB and 32GB @ 1.35V/1.5V |
| | • Virtualization: VT-x, VT-d, and VT-c | |
| **Chipset** | • Intel® C602J Chipset | |
| **Expansion Slots** | • Six (6) PCI Express 3.0 x8 slots (CPU1 Slot1/Slot2/Slot6 and CPU2 Slot3/Slot4/Slot5), | |
| **Graphics** | • Nuvoton BMC Video Controller (Matrox G200eW) | |
| **Network** | • One Intel I350AM2 Gigabit (10/100/1000 Mb/s) Ethernet Dual Port Controller for LAN1, LAN2 ports. | |
| | • Nuvoton WPCM450 Base-board Controller (BMC) supports IPMI_LAN 2.0 | |
| **I/O Devices** | **Serial_Link Connections** | |
| | • SATA Ports | Two (2) SATA 3.0 Ports (I-SATA0/1)<br>Four (4) SATA 2.0 Ports (I-SATA2-5) |
| | • RAID | SATA RAID 0, 1, 5, 10 for Windows, Linux (latest kernel), |
| | **Integrated IPMI 2.0** | |
| | • IPMI 2.0 supported by the WPCM450 BMC | |
| | **Serial (COM) Port** | |
| | • Two (2) Fast UART 16550 Connections: 9-pin RS-232 Port/Header (Back Panel COM1 Port/Front Panel COM2 Header) | |

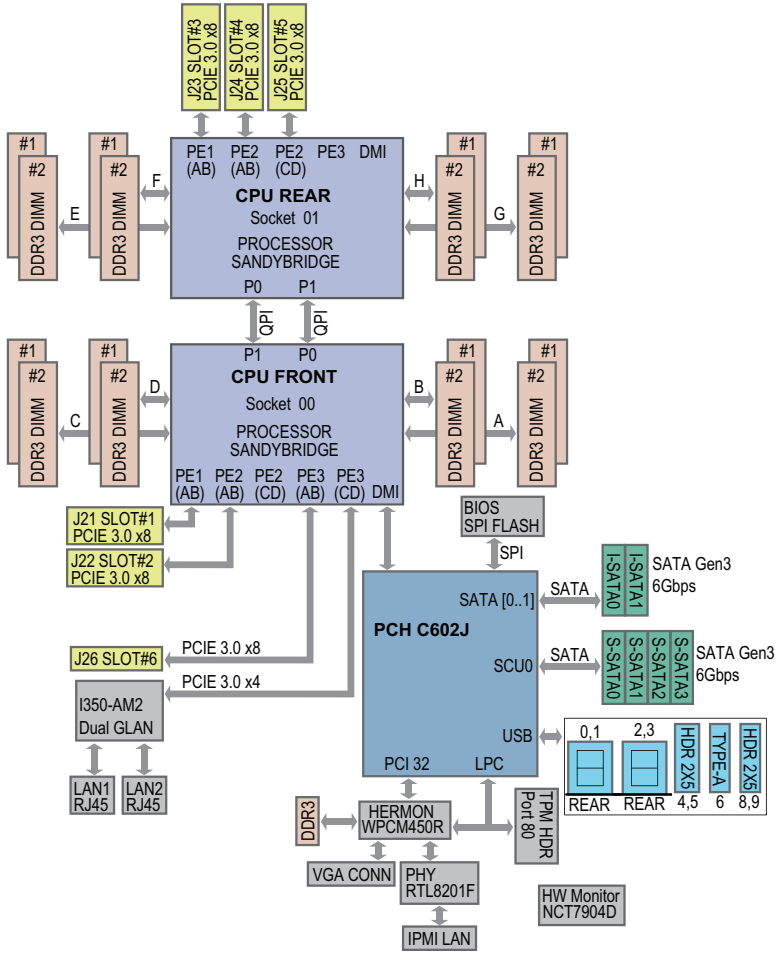
| | |
|---|---|
| | **Super I/O** |
| | • Nuvoton 83527HG |
| **Peripheral Devices** | **USB Devices** |
| | • Four (4) USB ports on the rear I/O panel (USB 0/1, USB 2/3), |
| | • Four (4) USB connections for front access (USB 4/5, USB 8/9), |
| | • One (1) Type A USB connection for front access (USB 6) |
| **BIOS** | • 16 MB SPI AMI BIOS® SM Flash BIOS |
| | • APM 1.2, PCI 2.3, ACPI 1.0/2.0/3.0/4.0, USB Keyboard, Plug & Play (PnP) and SMBIOS 2.7.1 |
| **Power Config.** | • ACPI/APM Power Management |
| | • Main switch override mechanism |
| | • Power-on mode for AC power recovery<br>• Intel® Intelligent Power Node Manager (NM) (Available when the NMView utility is installed in the system)<br>• Manageability Engine (ME) |
| **PC Health Monitoring** | **CPU Monitoring** |
| | • Onboard voltage monitors for CPU Cores, +3.3V, 3.3VSB, +5V, +12V, -12V, VBT, and Memory Voltages |
| | • CPU Thermal Design Power (TDP): support up to 135W (See Note 1 next page) |
| | • CPU 6-Phase switching voltage regulator |
| | • CPU/System overheat LED and control |
| | • CPU Thermal Trip support |
| | • Thermal Monitor 2 (TM2) support |
| | **Fan Control** |
| | • Fan status monitoring with firmware fan speed control via IPMI |
| | • Low noise fan speed control |
| **System Manage-ment** | • PECI (Platform Environment Configuration Interface) 2.0 support |
| | • UID (Unit Identification)/Remote UID |
| | • System resource alert via SuperDoctor III |
| | • SuperoDoctor III, Watch Dog, NMI |
| | • Chassis Intrusion Header and Detection |

| | |
|---|---|
| **Dimensions** | • 13.00" (L) x 12.00" (W) (330.20 mm x 340.80 mm) |

**Note 1**: CPU Maximum Thermal Design Power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, please check the chassis and heatsink specifications for proper CPU TDP sizing.

**Note 2**: For IPMI Configuration Instructions, please refer to the Embedded IPMI Configuration User's Guide available @ http://www.supermicro.com/support/manuals/.

## X9DRD-EF Block Diagram




**System Block Diagram**

**Note:** This is a general block diagram and may not exactly represent the features on your motherboard. See the Motherboard Features pages for the actual specifications of each motherboard.

## 1-2 Processor and Chipset Overview

Built upon the functionality and the capability of Intel E5-2600 Series (Socket R) processors and the C602J chipset, the X9DRD-EF motherboard provides the performance and feature sets required for dual processor-based HPC/Cluster/ Database servers.

With support of Intel QuickPath interconnect (QPI) Technology, the X9DRD-EF offers point-to-point serial interconnect interface with a transfer speed of up to 8.0 GT/s, providing superb system performance.

The C602J chipset provides extensive IO support, including the following functions and capabilities:

- ACPI Power Management Logic Support, Rev. 4.0
- USB host interface with support of up to 9 connections
- Intel Rapid Storage Technology supported
- Intel Virtualization Technology for Directed I/O (Intel VT-d) supported
- Intel Trusted Execution Technology supported
- Serial Peripheral Interface (SPI) Supported
- Digital Media Interface (DMI) supported
- Advanced Host Controller Interface (AHCI) supported

## 1-3 Special Features

### Recovery from AC Power Loss

The Basic I/O System (BIOS) provides a setting that determines how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on), or for it to automatically return to the power-on state. See the Advanced BIOS Setup section for this setting. The default setting is **Last State**.

## 1-4 PC Health Monitoring

This section describes the features of PC health monitoring of the motherboard. This motherboard has an onboard System_Hardware_Monitor chip that supports PC health monitoring. An onboard voltage monitor will scan voltages and power usage continuously. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

### Fan Status Monitor with Firmware Control

The PC health monitoring chip can check the RPM status of a cooling fan. The onboard CPU and chassis fans are controlled by firmware Thermal Management via IPMI 2.0.

### Environmental Temperature Control

A thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The thermal management runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent the CPU from overheating. The onboard chassis thermal circuitry can monitor the overall system temperature and alert the user when the chassis temperature is too high.

**Note**: To avoid possible system overheating, please be sure to provide adequate airflow to your system.

### System Resource Alert

This feature is available when used with SuperDoctor III in the Windows OS environment or used with SuperDoctor II in Linux. SuperDoctor is used to notify the user of certain system events. For example, you can configure SuperDoctor

to provide you with warnings when the system temperature, CPU temperatures, voltages, and fan speeds go beyond a predefined range.

## 1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers.

In addition to operating system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play, and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures, while providing a processor architecture-independent implementation that is compatible with Windows 7, Windows Vista and Windows 2008 Operating Systems.

### Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will "wake up," and the LED will automatically stop blinking and remain on.

## 1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The X9DRD-EF motherboard accommodates 24-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, two 12V 8-pin, and the 4-pin power connections are also required to ensure adequate power supply to the system. Your power supply must also supply 1.5A for the Ethernet ports.

**Warning!** To prevent damage to the power supply or the motherboard, please use a power supply that contains a 24-pin, a 4-pin, and two 8-pin power connectors. Be sure to connect the power supply to the 24-pin power connector (JPW1), and the two 8-pin power connectors (JPW2/3) on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant. (For more information, please refer to the website at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

## 1-7 Super I/O

The Super I/O supports two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability, and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

## 1-8 Advanced Power Management

The new advanced power management features supported by this motherboard include IPNM and ME. Please note that you will need to do following to use these two new features:

- Use a power supply that supports PMBus 1.1 or 1.2.
- Install the NMView software in your system. NMView is optional and can be purchased from Supermicro.

### Intel® Intelligent Power Node Manager (IPNM)

The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-compatible Manageability Engine (ME) firmware installed in your system for IPNM support.

**Note**: Support for IPNM Specification Version 1.5 or Vision 2.0 depends on the power supply used in the system.

### Manageability Engine (ME)

The Manageability Engine, which is an ARC controller embedded in the PCH, provides Server Platform Services (SPS) to your system. The services provided by SPS are different from those provided by the ME on client platforms.

## 1-9 Overview of the Nuvoton WPCM450 Controller

The Nuvoton WPCM450 Controller, a Baseboard Management Controller (BMC), supports 2D/VGA-compatible Graphic Cores with PCI interface, creating multi-media virtualization via Keyboard/Video/Mouse Redirection (KVMR). The WPCM450 Controller is ideal for remote system management.

The WPCM450 Controller interfaces with the host system via PCI connections to communicate with the graphics cores. It supports USB 2.0 and 1.1 for remote keyboard/mouse/virtual media emulation. It also provides LPC interface support to control Super IO functions. The WPCM450 Controller is connected to the network via an external Ethernet PHY module or shared NCSI connections.

The WPCM450 communicates with onboard components via six SMBus interfaces, PECI (Platform Environment Control Interface) buses, and General Purpose I/O ports.

### Other Features Supported by the WPCM BMC Controller

The WPCM450 supports the following features:

- IPMI 2.0
- Serial over LAN
- KVM over LAN
- LAN Alerting-SNMP Trap
- Event Log
- X-Bus parallel interface for I/O expansion
- Multiple ADC inputs, Analog and Digital Video outputs
- SPI Flash Host BIOS and firmware bootstrap program supported
- Reduced Media Independent Interface (RMII)
- OS (Operating System) Independency

- Provides remote Hardware Health Monitoring via IPMI. Key features
- Provides Network Management Security via remote access/console redirection.
- Supports the following Management tools: IPMIView, CLI (Command Line Interface)
- RMCP+ protocol supported

**Note 1:** For more information on IPMI configuration, please refer to the IPMI User's Guide posted on our website at http://www.supermicro.com/support/manuals/.

**Note 2**: The term "IPMI controller" and the term "BMC controller" can be used interchangeably in this section.

# Chapter 2

# Installation

## 2-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure that your system chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

### Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure that the person handling it is static protected.

## 2-2 Processor and Heatsink Installation

**Warning**: When handling the processor package, avoid placing direct pressure on the label area.

**Notes:**

Always connect the power cord last, and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.

Make sure to install the motherboard into the chassis before you install the CPU heatsink.

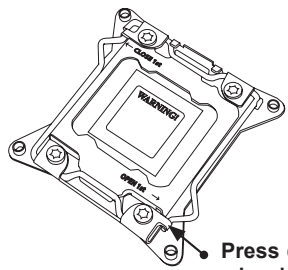
When receiving a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.

Refer to the Supermicro website for updates on CPU support.

### Installing the LGA2011 Processor

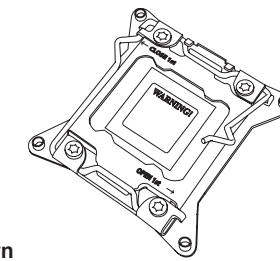
1. There are two load levers on the LGA2011 socket. To open the socket cover, first press and release the load lever labeled 'Open 1st'.

**1**

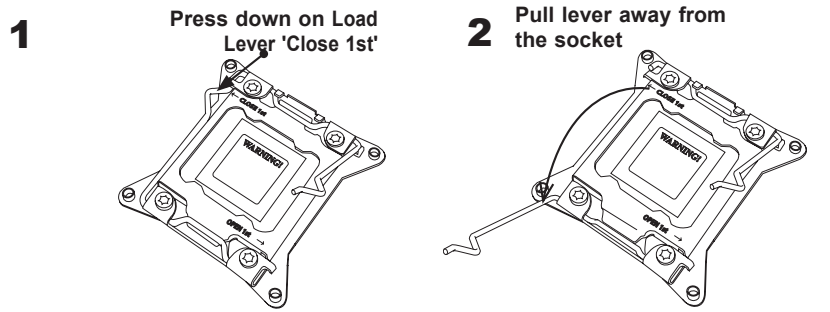



**Press down on Load Lever labeled 'Open 1st'.**

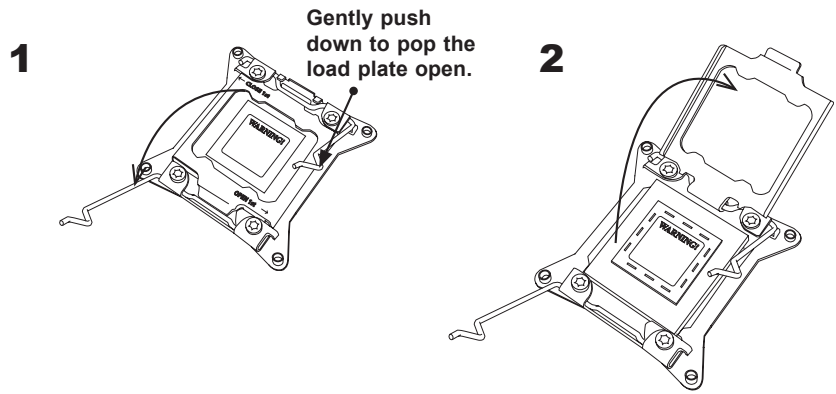
**2**



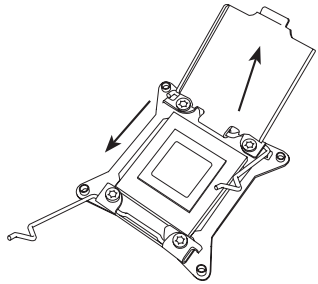
2. Press the second load lever labeled 'Close 1st' to release the load plate that covers the CPU socket from its locking position.



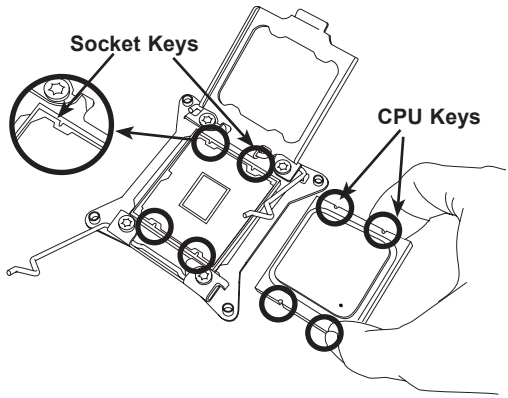

3. With the lever labeled 'Close 1st' fully retracted, gently push down on the lever labelled 'Open 1st' to open the load plate. Lift the load plate to open it completely.



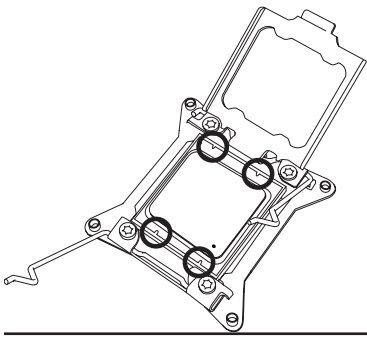
1. Use your thumb, and index fingers to loosen the lever and open the load plate.



2. Using your thumb and index finger, hold the CPU on its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.




3. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.)

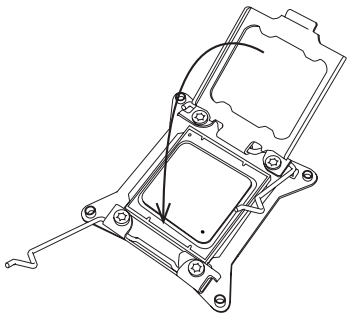


**Warning:** You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again to make sure that the CPU is aligned properly.

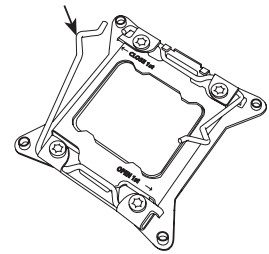
4. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

5. Close the load plate with the CPU inside the socket. Lock the lever labelled 'Close 1st' first, then lock the lever labelled 'Open 1st' second. Using your thumb gently push the load levers down to the lever locks.

**1** **Gently close the load plate.**



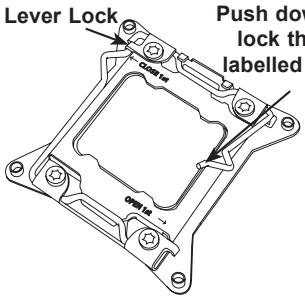
**2** **Push down and lock the lever labelled 'Close 1st'.**



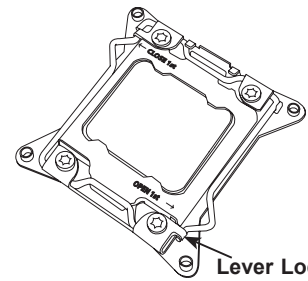

**3**

**Lever Lock**

**Push down and lock the lever labelled 'Open 1st'.**




**4**



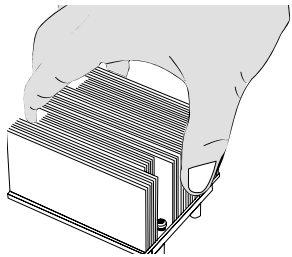
## Installing a Passive CPU Heatsink

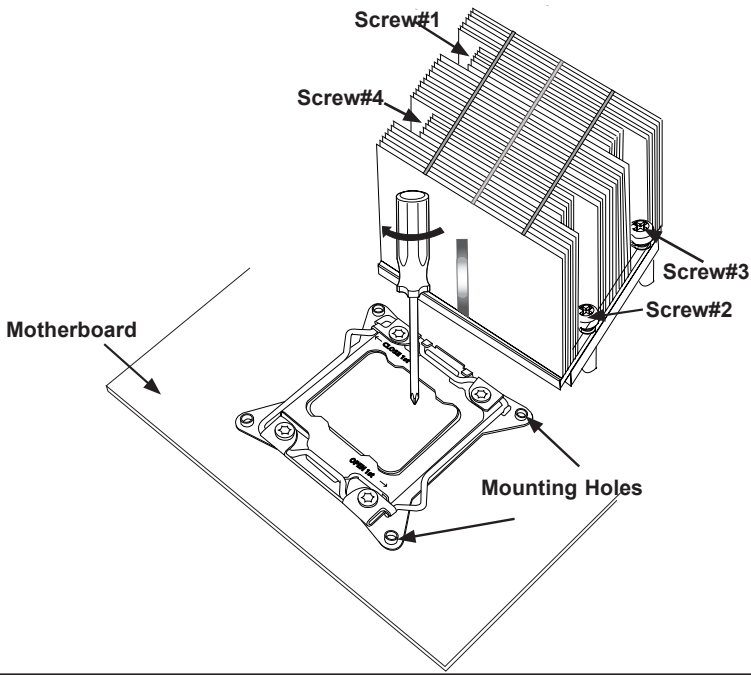
1. Do not apply any thermal grease to the heatsink or the CPU die -- the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the Motherboard's and the Heatsink Bracket underneath.

3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug (-do not over-tighten the screws to avoid possible damage to the CPU.)

4. Finish the installation by fully tightening all four screws.





## Removing the Heatsink

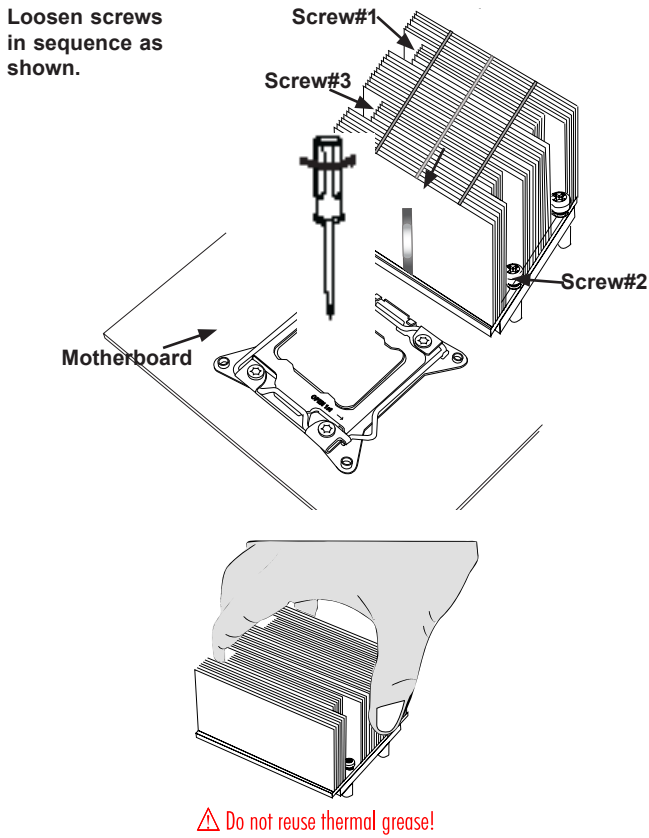
**Warning:** We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage done to the CPU or the CPU socket.

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.

2. Gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)

3. Once the CPU is loosened, remove the CPU from the CPU socket.

4. Remove the used thermal grease and clean the surface of the CPU and the heatsink, Reapply the proper amount of thermal grease on the surface before reinstalling the CPU and the heatsink. (Do not reuse old thermal grease.)



## 2-3 Installing and Removing the Memory Modules

**Note**: Check Supermicro's website for recommended memory modules.

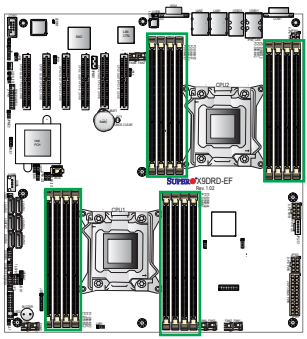
***CAUTION***

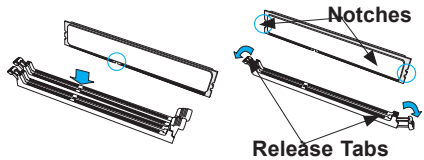
STOP Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

### Installing & Removing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with DIMM# A1.

2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.





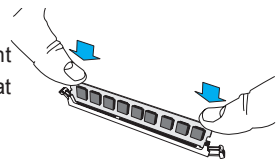

3. Align the key of the DIMM module with the receptive point on the memory slot.

4. Align the notches on both ends of the module against the receptive points on the ends of the slot.

5. Use two thumbs together to press the notches on both ends of the module straight down into the slot until the module snaps into place.

6. Press the release tabs to the locking positions to secure the DIMM module into the slot.

Press both notches straight down into the memory slot at the same time.



### Removing Memory Modules

Press both notches on the ends of the DIMM module to unlock it. Once it is loosened, once it is loosened, remove it from the memory slot.

### *Memory Support for the X9DRD-EF Motherboard*

The X9DRD-EF motherboard supports 240-pin Registered (RDIMM)/Load Reduced (LRDIMM) ECC or Unbuffered (UDIMM) ECC/Non-ECC DDR3 800/1066/1333/1600 MHz memory modules of up to 512 GB in 4-channel 16 DIMM modules. Please refer to our website a at http://www.supermicro.com/products/motherboard.

#### *Processor & Memory Module Population Configuration*

For memory to work properly, follow the tables below for memory installation.

| Processors and their Corresponding Memory Modules | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CPU#** | **Corresponding DIMM Modules** | | | | | | | |
| **CPU 1** | P1-DIMMA1 | P1-DIMMB1 | P1-DIMMC1 | P1-DIMMD1 | P1-DIMMA2 | P1-DIMMB2 | P1-DIMMC2 | P1-DIMMD2 |
| **CPU2** | P2-DIMME1 | P2-DIMMF1 | P2-DIMMG1 | P2-DIMMH1 | P2-DIMME2 | P2-DIMM F2 | P2-DIMMG2 | P2-DIMMH2 |

| Processor and Memory Module Population for Optimal Performance | |
|---|---|
| **Number of CPUs+DIMMs** | **CPU and Memory Population Configuration Table (For memory to work properly, please follow the instructions below.)** |
| **1 CPU & 2 DIMMs** | CPU1<br>P1-DIMMA1/P1-DIMMB1 |
| **1 CPU & 4 DIMMs** | CPU1<br>P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1 |
| **1 CPU & 5~8 DIMMs** | CPU1<br>P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1 + Any memory pairs in P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2 slots |
| **2 CPUs & 4 DIMMs** | CPU1 + CPU2<br>P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1 |
| **2 CPUs & 6 DIMMs** | CPU1 + CPU2<br>P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1 |
| **2 CPUs & 8 DIMMs** | CPU1 + CPU2<br>P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 |
| **2 CPUs & 10~16 DIMMs** | CPU1/CPU2<br>P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 + Any memory pairs in P1, P2 DIMM slots |
| **2 CPUs & 16 DIMMs** | CPU1/CPU2<br>P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1,P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2, P2-DIMME2/P2-DIMMF2/P2-DIMMG2/P2-DIMMH2 |

## *Populating UDIMM (ECC/Non-ECC) Memory Modules*

| Intel E5-2600 Series Processor UDIMM Memory Support | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Ranks Per DIMM & Data Width** | **Memory Capacity Per DIMM (See the Note below)** | | | **Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)** | | | | | |
| | | | | **1 Slot Per Channel** | | **2 Slots Per Channel** | | | |
| | | | | **1DPC** | | **1DPC** | | **2DPC** | |
| | | | | **1.35V** | **1.5V** | **1.35V** | **1.5V** | **1.35V** | **1.5V** |
| **SRx8 Non-ECC** | 1GB | 2GB | 4GB | NA | 1066, 1333, 1600 | NA | 1066, 1333 | NA | 1066, 1333 |
| **DRx8 Non-ECC** | 2GB | 4GB | 8GB | NA | 1066, 1333, 1600 | NA | 1066, 1333 | NA | 1066, 1333 |
| **SRx16 Non-ECC** | 512MB | 1GB | 2GB | NA | 1066, 1333, 1600 | NA | 1066, 1333 | NA | 1066, 1333 |
| **SRx8 ECC** | 1GB | 2GB | 4GB | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333 | 1066 | 1066, 1333 |
| **DRx8 ECC** | 2GB | 4GB | 8GB | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333 | 1066 | 1066, 1333 |
| **Note:** For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at http://www.supermicro.com/support/resources/mem.cfm. | | | | | | | | | |

## *Populating RDIMM (ECC) Memory Modules*

| Intel E5-2600 Series Processor RDIMM Memory Support | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Ranks Per DIMM & Data Width** | **Memory Capacity Per DIMM (See the Note Below)** | | | **Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)** | | | | | |
| | | | | **1 Slot Per Channel** | | **2 Slots Per Channel** | | | |
| | | | | **1DPC** | | **1DPC** | | **2DPC** | |
| | | | | **1.35V** | **1.5V** | **1.35V** | **1.5V** | **1.35V** | **1.5V** |
| **SRx8** | 1GB | 2GB | 4GB | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 |
| **DRx8** | 2GB | 4GB | 8GB | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 |
| **SRx4** | 2GB | 4GB | 8GB | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 |
| **DRx4** | 4GB | 8GB | 16GB | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 | 1066, 1333 | 1066, 1333, 1600 |
| **QRx4** | 8GB | 16GB | 32GB | 800 | 1066 | 800 | 1066 | 800 | 800 |
| **QRx8** | 4GB | 8GB | 16GB | 800 | 1066 | 800 | 1066 | 800 | 800 |
| **Note:** For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at http://www.supermicro.com/support/resources/mem.cfm. | | | | | | | | | |

*Populating LRDIMM (ECC) Memory Modules*

| Intel E5-2600 Series Processor LRDIMM Memory Support | | | | | | |
|---|---|---|---|---|---|---|
| Ranks Per DIMM & Data Width (See the Note Below) | Memory Capacity Per DIMM | | Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC) | | | |
| | | | 1 Slot Per Channel | | 2 Slots Per Channel | |
| | | | 1DPC | | 1DPC and 2DPC | |
| | | | 1.35V | 1.5V | 1.35V | 1.5V |
| QRx4 (DDP) | 16GB | 32GB | 1066, 1333 | 1066, 1333 | 1066 | 1066, 1333 |
| QRx8 (P) | 8GB | 16GB | 1066, 1333 | 1066, 1333 | 1066 | 1066, 1333 |

**Note:** For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at http://www.supermicro.com/support/resources/mem.cfm.

*Other Important Notes and Restrictions*

- For the memory modules to work properly, please install DIMM modules of the same type, same speed and same operating frequency on the motherboard. Mixing of RDIMMs, UDIMMs or LRDIMMs is not allowed. Do not install both ECC and Non-ECC memory modules on the same motherboard.

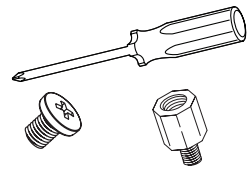
- Using DDR3 DIMMs with different operating frequencies is not allowed. All channels in a system will run at the lowest common frequency.

## 2-4 Motherboard Installation

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

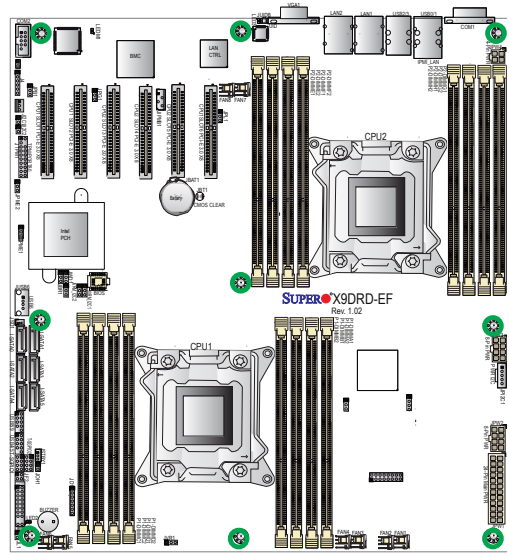
### Tools Needed

- Phillips Screwdriver
- Pan head screws (9 pieces)
- Standoffs (9 pieces, if needed)



### Location of Mounting Holes

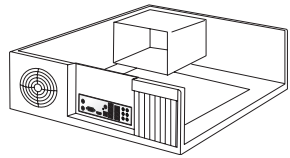
There are nine (9) amounting holes on this motherboard. See the layout on the right.




**Caution:** 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to prevent damage to these components when installing the motherboard to the chassis.

## Installing the Motherboard

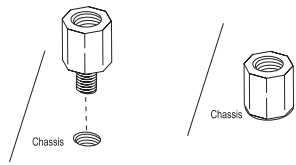
1. Install the I/O shield into the chassis.



2. Locate the mounting holes on the motherboard.

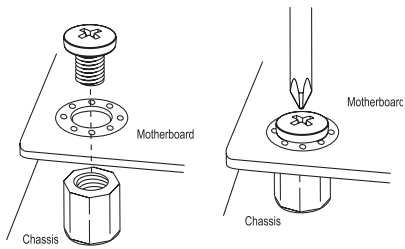
3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.

4. Install standoffs in the chassis as needed.




5. Install the motherboard into the chassis carefully to avoid damaging motherboard components.

6. Using the Phillips screwdriver, insert a Pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.




7. Repeat Step 5 to insert #6 screws into all mounting holes.

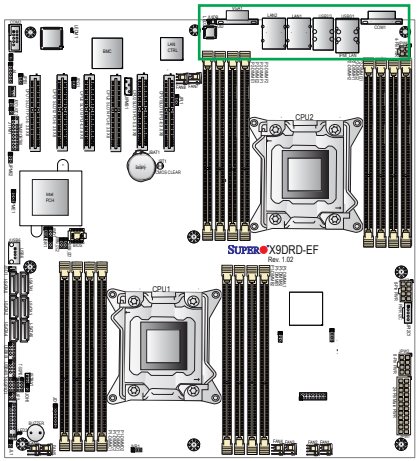
8. Make sure that the motherboard is securely placed in the chassis.

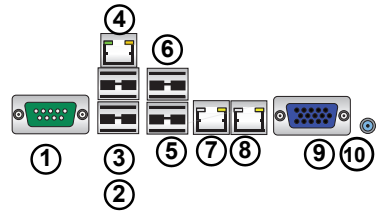
**Note:** Images displayed are is for illustration only. Your chassis or components might look different from those shown in this manual.

## 2-5 Control Panel Connectors and I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See the picture below for the colors and locations of the various I/O ports.

### Back Panel Connectors and I/O Ports




### Back Panel I/O Port Locations and Definitions

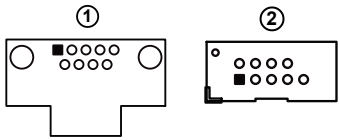
| | |
|---|---|
| 1. | COM Port 1 (Turquoise) |
| 2. | Back Panel USB Port 0 |
| 3. | Back Panel USB Port 1 |
| 4. | IPMI_Dedicated LAN |
| 5. | Back Panel USB Port 2 |
| 6. | Back Panel USB Port 3 |
| 7. | Gigabit LAN1 |
| 8. | Gigabit LAN2 |
| 9. | Back Panel VGA (Blue) |
| 10. | UID Switch |

### Serial Ports

Two COM connections (COM1 & COM2) are located on the motherboard. COM1 is located on the Backplane I/O panel. COM2, located close to CPU1 Slot1, provides front access support. See the table on the right for pin definitions.

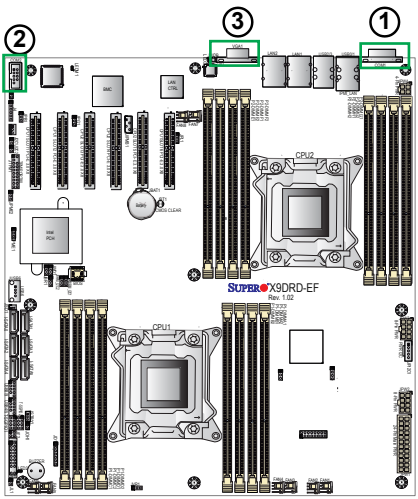
**Serial COM) Ports Pin Definitions**

| Pin # | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | DCD | 6 | DSR |
| 2 | RXD | 7 | RTS |
| 3 | TXD | 8 | CTS |
| 4 | DTR | 9 | RI |
| 5 | Ground | 10 | N/A |

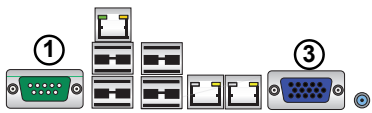



### Video Connection

A Video (VGA) port is located next to LAN2 on the I/O backplane. Refer to the board layout below for the location.




1. COM1
2. COM2
3. VGA



### Universal Serial Bus (USB)

Four Universal Serial Bus ports (USB 0/1, USB 2/3) are located on the I/O back panel. In addition, three USB headers, located close to the IO Hub, provides four front-accessible USB connections (USB 4/5, USB 8/9). One Type A connector (USB6) also supports front panel USB connection. (Cables are not included). See the tables on the right for pin definitions.

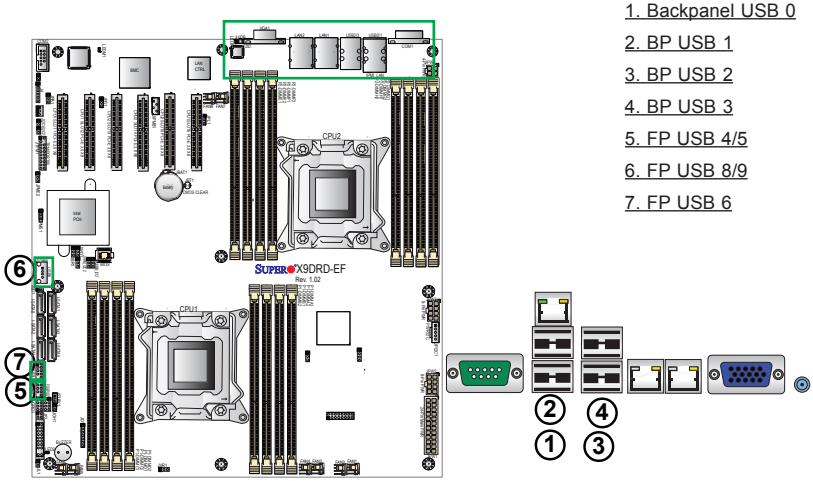
**Backplane USB (0/1, 2/3) Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | +5V |
| 2 | PO- |
| 3 | PO+ |
| 4 | Ground |
| 5 | NA |

**FP USB (4/5, 8/9, USB 6) Pin Definitions**

| USB 4, 8, 6, Pin # | Definition | USB 5, 9 Pin # | Definition |
|---|---|---|---|
| 1 | +5V | 1 | +5V |
| 2 | PO- | 2 | PO- |
| 3 | PO+ | 3 | PO+ |
| 4 | Ground | 4 | Ground |
| 5 | NC | 5 | Key |

(NC= No connection)




1. Backpanel USB 0
2. BP USB 1
3. BP USB 2
4. BP USB 3
5. FP USB 4/5
6. FP USB 8/9
7. FP USB 6

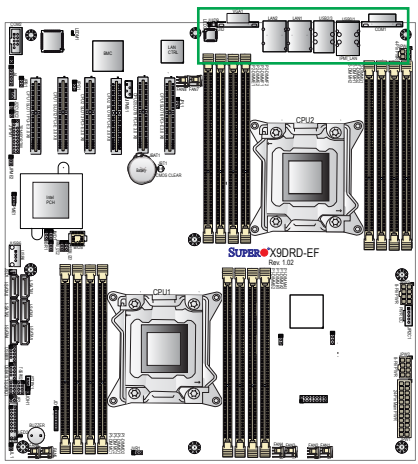
### Ethernet Ports

Two Gigabit Ethernet ports (LAN1, LAN2) are located on the I/O backplane on the motherboard. In addition, an IPMI_Dedicated LAN is located above USB 0/1 ports on the backplane to provide KVM support for IPMI 2.0. All these ports accept RJ45 type cables. Please refer to the LED Indicator Section for LAN LED information.

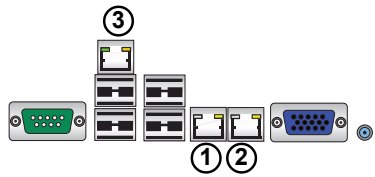
**LAN Ports Pin Definition**

| Pin# | Definition | | |
|---|---|---|---|
| 1 | P2V5SB | 10 | SGND |
| 2 | TD0+ | 11 | Act LED |
| 3 | TD0- | 12 | P3V3SB |
| 4 | TD1+ | 13 | Link 100 LED (Yellow, +3V3SB) |
| 5 | TD1- | 14 | Link 1000 LED (Yellow, +3V3SB) |
| 6 | TD2+ | 15 | Ground |
| 7 | TD2- | 16 | Ground |
| 8 | TD3+ | 17 | Ground |
| 9 | TD3- | 18 | Ground |

(NC: No Connection)




1. GLAN1
2 GLAN2
3. IPMI_LAN



### Unit Identifier Switch/UID LED Indicators

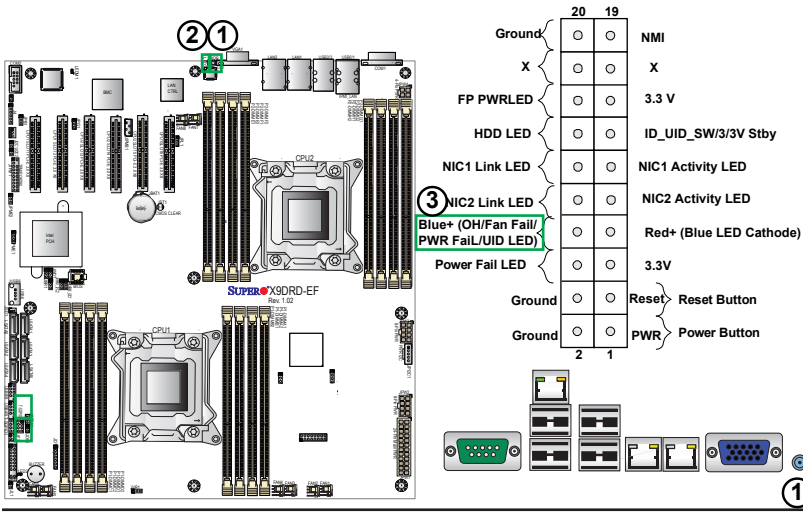
A Unit Identifier (UID) Switch and two LED Indicators are located on the motherboard. The UID Switch is located next to the VGA port on the backplane. The Rear UID LED (LED3) is located next to the UID Switch. The Front Panel UID LED is located at Pins 7/8 of the Front Control Panel at JF1. Connect a cable to Pin 8 on JF1 for Front Panel UID LED indication. When you press the UID switch, both Rear UID LED and Front Panel UID LED Indicators will be turned on. Press the UID switch again to turn off both LED Indicators. These UID Indicators provide easy identification of a system unit that may be in need of service.

**Note:** UID can also be triggered via IPMI on the motherboard. For more information on IPMI, please refer to the IPMI User's Guide posted on our website @http://www.supermicro.com.

| UID Switch | |
|---|---|
| Pin# | Definition |
| 1 | Ground |
| 2 | Ground |
| 3 | Button In |
| 4 | Ground |

| UID LED (LED3) Status | |
|---|---|
| Color/State | Status |
| Blue: On | Unit Identified |

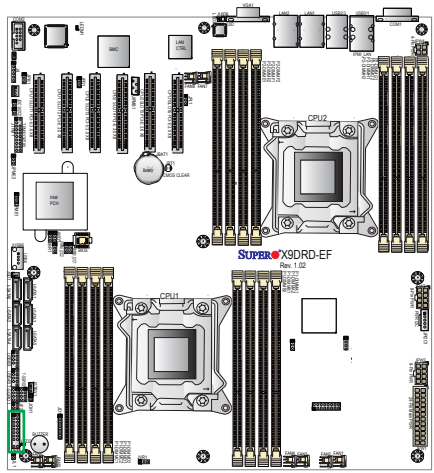
1. UID Switch
2. Rear UID LED (LED3)
3. Front UID LED

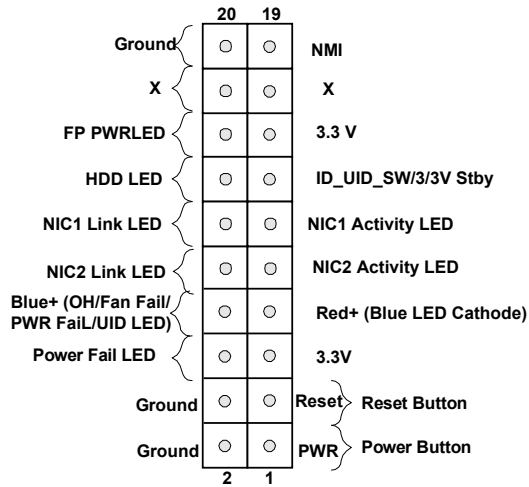


## Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro's server chassis. See the figure below for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

**JF1 Header Pins**





## Front Control Panel Pin Definitions

### NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

| NMI Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 19 | Control |
| 20 | Ground |

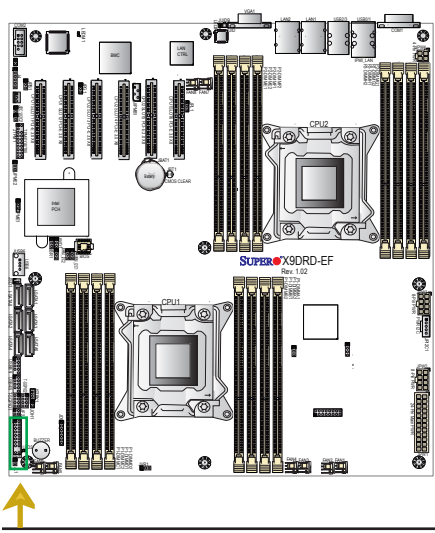
### Power LED

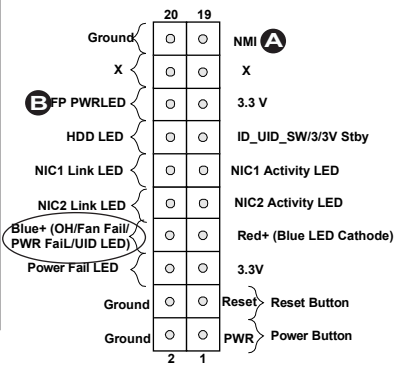
The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

| Power LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 15 | 3.3V |
| 16 | PWR LED |

A. NMI

B. PWR LED



### HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activity. See the table on the right for pin definitions.

**HDD LED Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 13 | 3.3V Standby |
| 14 | HD Active |

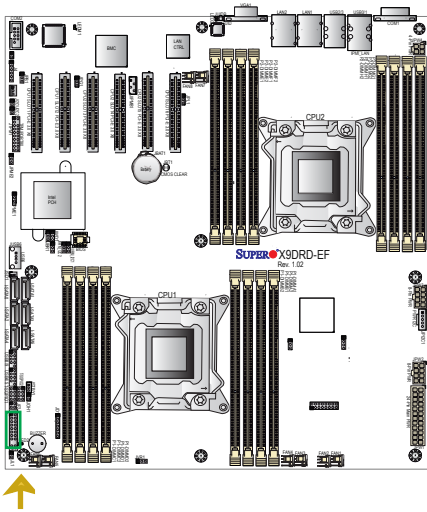
### NIC1/NIC2 LED Indicators

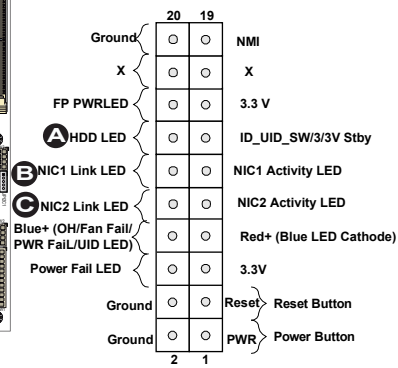
The NIC (Network Interface Controller) LED connection for GLAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for GLAN Port 2 is on Pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table on the right for pin definitions.

**GLAN1/2 LED Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 9 | Vcc |
| 10 | NIC 2 LED |
| 11 | Vcc |
| 12 | NIC 1 LED |

A. HDD LED
B. NIC1 LED
C. NIC2 LED



### Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED cable to pins 7 and 8 of Front Control Panel to use the Overheat/Fan Fail/Power Fail and UID LED connections. The Red LED on pin 7 provides warnings of overheat, fan failure or power failure. The Blue LED on pin 8 works as the front panel UID LED indicator. The Red LED takes precedence over the Blue LED by default. Refer to the table on the right for pin definitions.

**OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 7 | Red_LED-Cathode/OH/Fan Fail/ Power Fail5.5V.SB |
| 8 | Blue_UID LED |

**OH/Fan Fail/PWR Fail LED Status (Red LED)**

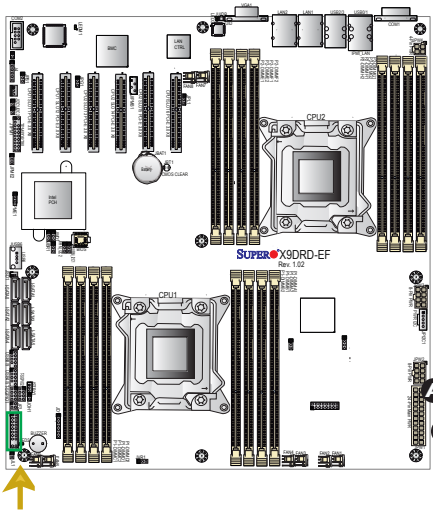
| State | Definition |
|---|---|
| Off | Normal |
| On | Overheat |
| Flashing | Fan Fail |

### Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

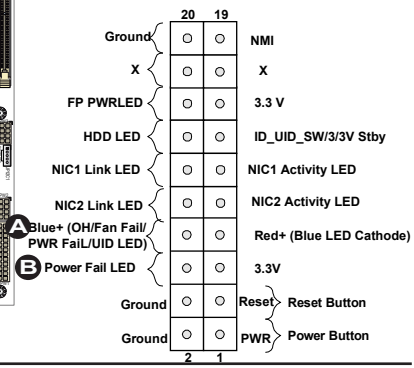
**PWR Fail LED Pin Definitions (JF1)**

| Pin# | Definition |
|---|---|
| 5 | 3.3V |
| 6 | PWR Supply Fail |




A. OH/Fail/PWR Fail LED

B. PWR Supply Fail



### Reset Button

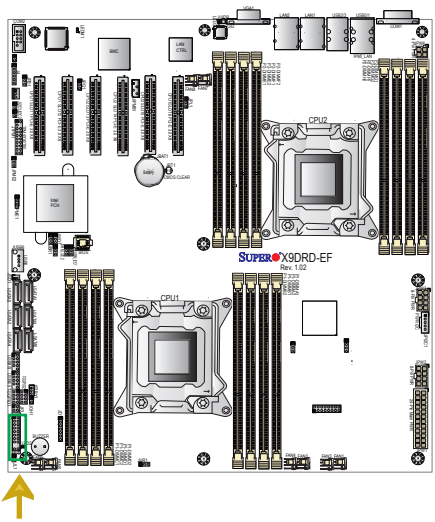
The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

| Reset Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 3 | Reset |
| 4 | Ground |

### Power Button

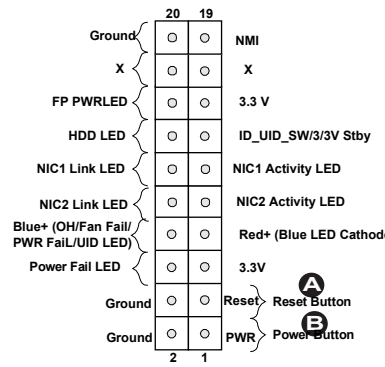
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - See Chapter 4). To turn off the power when the system is in suspend mode, press the button for 4 seconds or longer. Refer to the table on the right for pin definitions.

| Power Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 1 | Signal |
| 2 | Ground |




A. Reset Button

B. PWR Button



## 2-6 Connecting Cables

### Power Connectors

A 24-pin main power supply connector(JPW1), two 8-pin CPU power connectors (JPW2/3) and a 4-pin power connector (JPW4) are located on the motherboard. These power connectors meet the SSI EPS 12V specification and must be connected to your power supply to provide adequate power to the system. See the table on the right for pin definitions.

**Warning**: To prevent damage to the power supply or the motherboard, please use a power supply that contains a 24-pin, a 4-pin, and two 8-pin power connectors. Be sure to connect the power supply to the 24-pin power connector (JPW1), and the two 8-pin power connectors (JPW2/3) on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

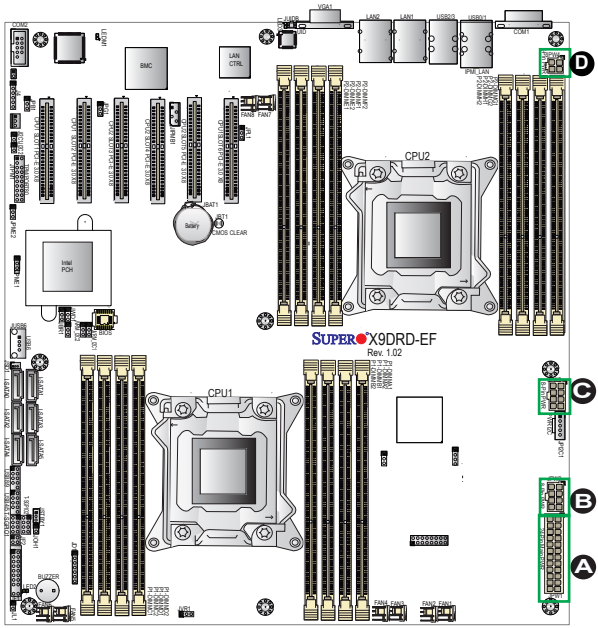
**ATX Power 24-pin Connector Pin Definitions**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 13 | +3.3V | 1 | +3.3V |
| 14 | -12V | 2 | +3.3V |
| 15 | COM | 3 | COM |
| 16 | PS_ON | 4 | +5V |
| 17 | COM | 5 | COM |
| 18 | COM | 6 | +5V |
| 19 | COM | 7 | COM |
| 20 | Res (NC) | 8 | PWR_OK |
| 21 | +5V | 9 | 5VSB |
| 22 | +5V | 10 | +12V |
| 23 | +5V | 11 | +12V |
| 24 | COM | 12 | +3.3V |

**12V 8-pin PWR Connector Pin Definitions**

| Pins | Definition |
|---|---|
| 1 through 4 | Ground |
| 5 through 8 | +12V |

**(Required)**




A. JPW1: 24-pin ATX PWR (Req'd)
B. JPW2: 8-pin Processor PWR (Req'd)
C. JPW3: 8-pin Processor PWR (Req'd)
D. JPW4: 4-pin Processor PWR
E. JPW5: 4-pin Processor PWR (Req'd)

### Fan Headers

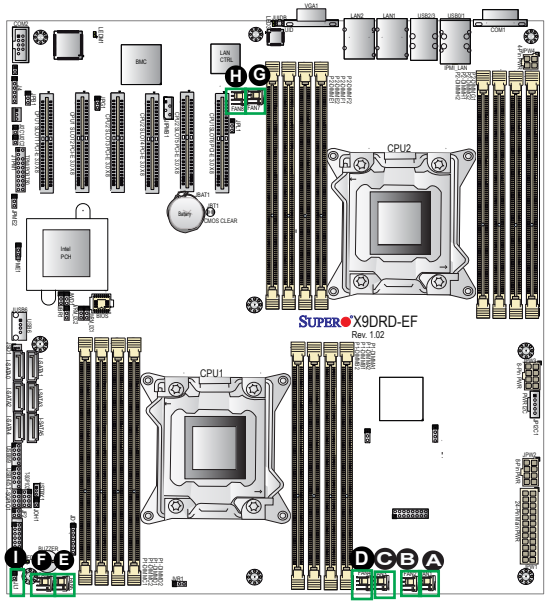
This motherboard has eight system/CPU fan headers (Fan 1~Fan 8) on the motherboard. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by Thermal Management via IPMI interface. (See Chapter 5 for more details.) See the table on the right for pin definitions.

| Fan Header Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | Ground |
| 2 | +12V |
| 3 | Tachometer |
| 4 | PWR Modulation |

### Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

| Chassis Intrusion Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | Intrusion Input |
| 2 | Ground |

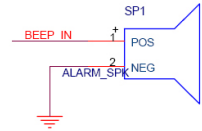



A. Fan 1
B. Fan 2
C. Fan 3
D. Fan 4
E. Fan 5
F. Fan 6
G. Fan 7
H. Fan 8
I. Chassis Intrusion

### Internal Speaker

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the Internal Buzzer (SP1).

| Internal Buzzer (SP1) Pin Definition | | |
|---|---|---|
| Pin# | | Definitions |
| Pin 1 | Pos. (+) | Beep In |
| Pin 2 | Neg. (-) | Alarm Speaker |

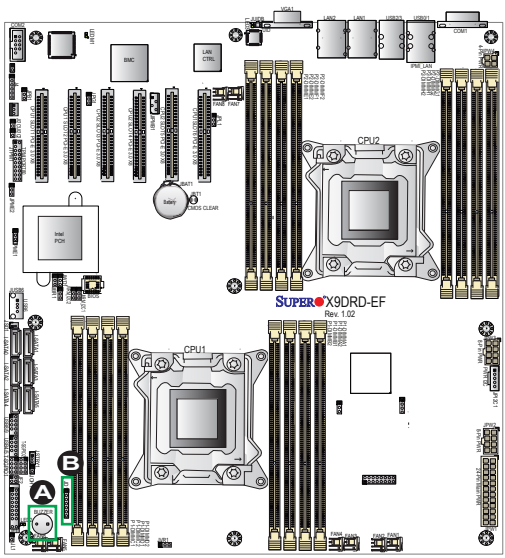



### Power LED/Speaker

On JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are used with an external speaker. If you wish to use the on-board speaker, you should close pins 6-7 with a jumper.

| PWR LED Connector Pin Definitions | |
|---|---|
| Pin Setting | Definition |
| Pin 1 | Anode (+) |
| Pin2 | Cathode (-) |
| Pin3 | NA |

| Speaker Connector Pin Settings | |
|---|---|
| Pin Setting | Definition |
| Pins 4-7 | External Speaker |
| Pins 6-7 | Internal Speaker |




A. Internal Speaker (Buzzer)

B. PWR LED/Speaker

### TPM Header/Port 80

A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. See the table on the right for pin definitions.

**TPM/Port 80 Header Pin Definitions**

| Pin # | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | LCLK | 2 | GND |
| 3 | LFRAME# | 4 | <(KEY)> |
| 5 | LRESET# | 6 | +5V (X) |
| 7 | LAD 3 | 8 | LAD 2 |
| 9 | +3.3V | 10 | LAD1 |
| 11 | LAD0 | 12 | GND |
| 13 | SMB_CLK4 | 14 | SMB_DAT4 |
| 15 | +3V_DUAL | 16 | SERIRQ |
| 17 | GND | 18 | CLKRUN# (X) |
| 19 | LPCPD# | 20 | LDRQ# (X) |

### Overheat LED/Fan Fail

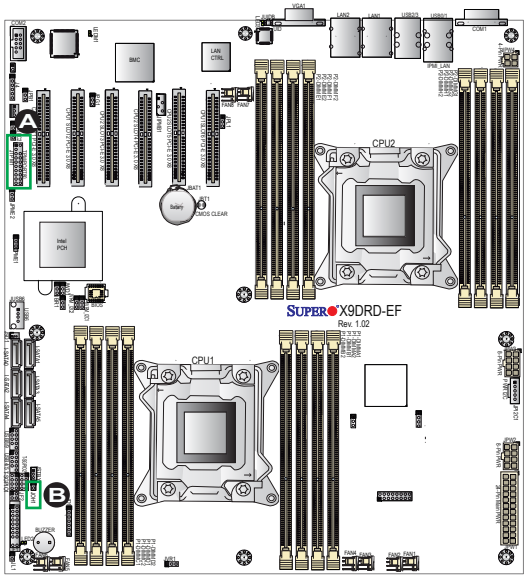
The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the tables on right for pin definitions.

**Overheat LED Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | 5vDC |
| 2 | OH Active |

**OH/Fan Fail LED Status**

| State | Message |
|---|---|
| Solid | Overheat |
| Blinking | Fan Fail |




A. TPM/Port 80 Header

B. JOH1

### Power SMB (I²C) Connector

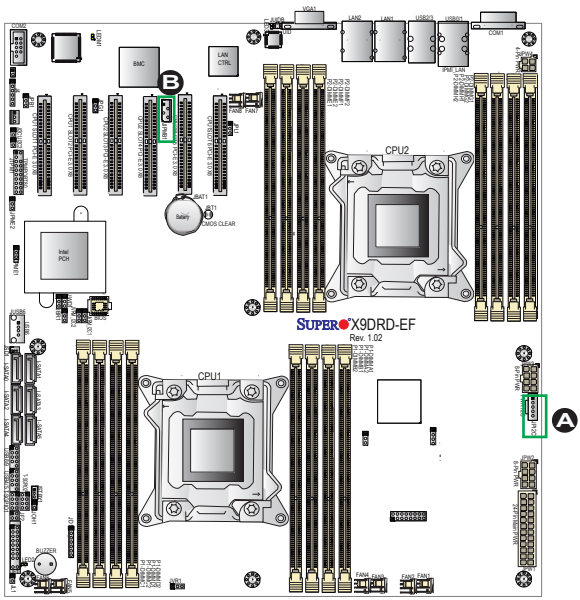
Power System Management Bus (I²C) Connector (JPI²C1) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

| PWR SMB Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | Clock |
| 2 | Data |
| 3 | PWR Fail |
| 4 | Ground |
| 5 | +3.3V |

### IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system.

| IPMB Header Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | Data |
| 2 | Ground |
| 3 | Clock |
| 4 | No Connection |




A. JPI²C1

B. JIPMB1

### T-SGPIO 1/2 Headers

Two SGPIO (Serial Link General Purpose Input/Output) headers are located on the motherboard. T-SGPIO 1/2 provide onboard SATA support on the motherboard. See the table on the right for pin definitions.

**T-SGPIO 1/2 Pin Definitions**

| Pin# | Definition | Pin | Definition |
|---|---|---|---|
| 1 | NC | 2 | NC |
| 3 | Ground | 4 | Data |
| 5 | Load | 6 | Ground |
| 7 | Clock | 8 | NC |

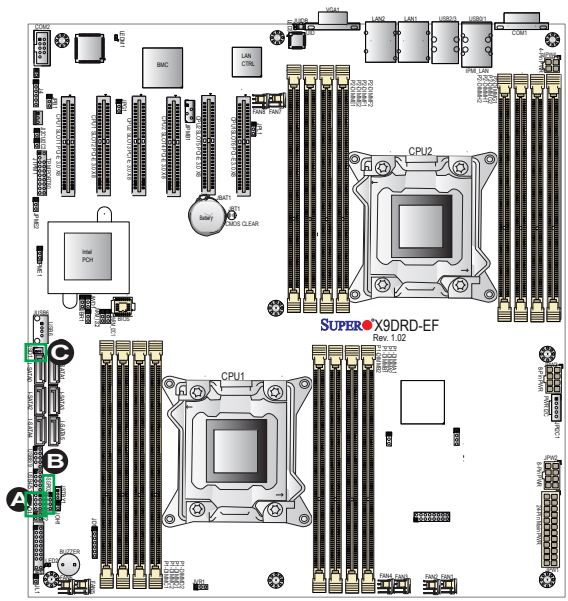
**Note:** NC= No Connection

### DOM Power Connector

A power connector for SATA DOM (Disk_On_Module) devices is located at JSD1. Connect an appropriate cable here to provide power support for your Serial Link DOM devices.

**DOM PWR Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | +5V |
| 2 | Ground |
| 3 | Ground |

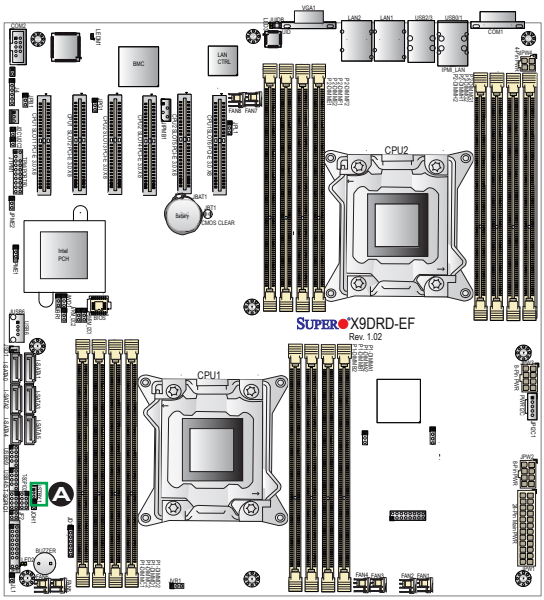



A. T-SGPIO1
B. T-SGPIO2
C. DOM PWR

### Standby Power Header

The +5V Standby Power header is located at JSTBY1 on the motherboard. See the table on the right for pin definitions. (You must also have a card with a Standby Power connector and a cable to use this feature.)

| Standby PWR Pin Definitions | |
|---|---|
| Pin# | Definition |
| 1 | +5V Standby |
| 2 | Ground |
| 3 | Wake-up |

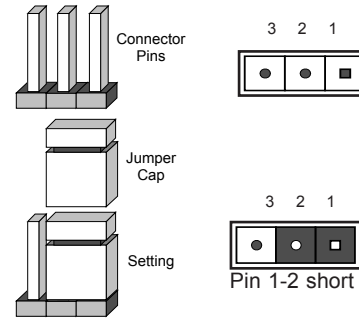



A. Standby PWR

# 2-7 Jumper Settings

## Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

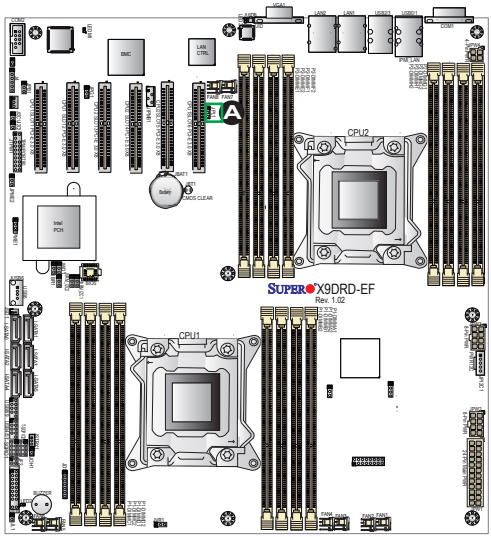



**Note:** On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

### GLAN Enable/Disable

JPL1 enables or disables the GLAN Ports 1/2 on the motherboard. See the table on the right for jumper settings. The default setting is Enabled.

| GLAN Enable Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| 1-2 | Enabled (default) |
| 2-3 | Disabled |




A. GLAN Ports Enable

### CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

**Note 1.** For an ATX power supply, you must completely shut down the system, remove the AC power cord, and then short JBT1 to clear CMOS.

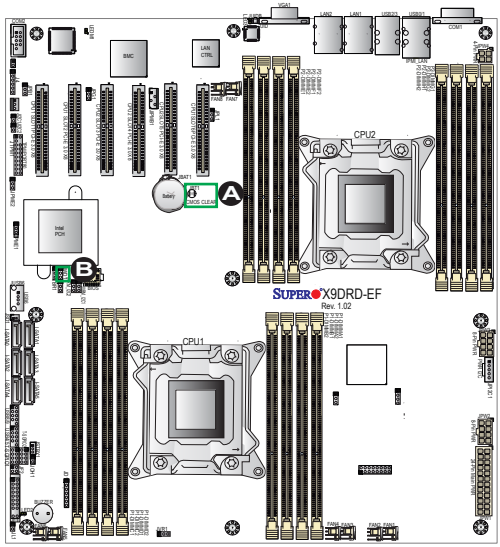
**Note 2.** Be sure to remove the onboard CMOS Battery before you short JBT1 to clear CMOS.

**Note 3.** Clearing CMOS will also clear all passwords.

### Watch Dog Enable/Disable

Watch Dog (JWD1) is a system monitor that will reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

| Watch Dog Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| Pins 1-2 | Reset (default) |
| Pins 2-3 | NMI |
| Open | Disabled |




A. Clear CMOS

B. Watch Dog Enable

### VGA Enable

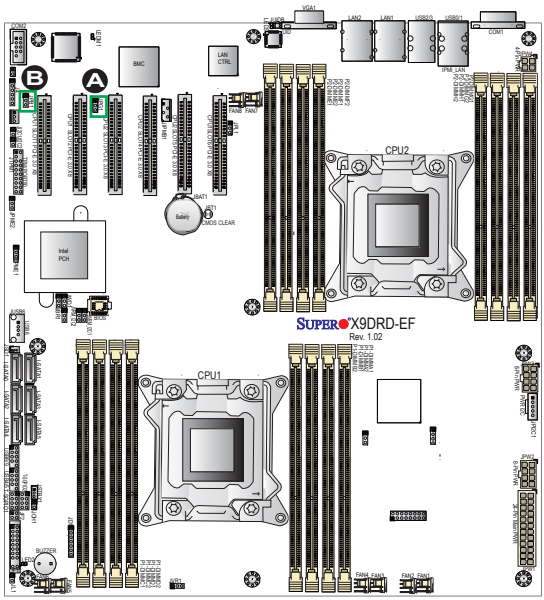
Jumper JPG1 allows the user to enable the onboard VGA connector. The default setting is 1-2 to enable the connection. See the table on the right for jumper settings.

| VGA Enable Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| 1-2 | Enabled (Default) |
| 2-3 | Disabled |

### BMC Enable

Jumper JPB1 allows you to enable the embedded WPCM 450 BMC (Baseboard Management) Controller to provide IPMI 2.0/KVM support on the motherboard. See the table on the right for jumper settings.

| BMC Enable Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| Pins 1-2 | BMC Enable (Default) |
| Pins 2-3 | Normal |

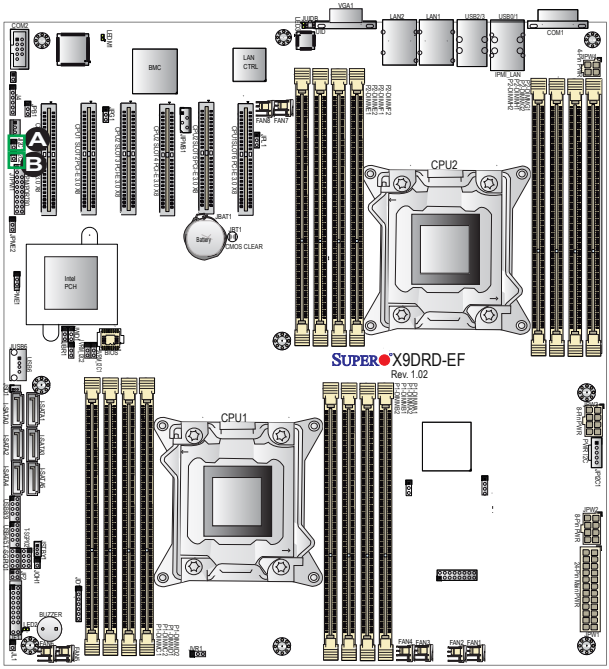



A. VGA Enabled
B. BMC Enabled

### I²C Bus to PCI-Exp. Slots

Use Jumpers JI²C1 and JI²C2 to connect the System Management Bus (I²C) to PCI-Express slots in order to improve PCI slot performance. These two jumpers are to be set at the same time. See the table on the right for jumper settings.

| I²C to PCI-E slots Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| Closed | Enabled |
| Open | Disabled (Default) |




A. JI²C1
B. JI²C2

## 2-8 Onboard LED Indicators

### GLAN LEDs

The Gigabit LAN ports are located on the IO Backplane on the motherboard. Each Ethernet LAN port has two LEDs. The Yellow LED indicates activity. The Link LED may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.

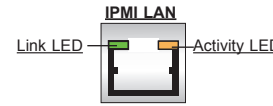
**Rear View** (when facing the rear side of the chassis)

| GLAN Activity Indicator (Left) LED Settings | | |
|---|---|---|
| Color | Status | Definition |
| Yellow | Flashing | Active |

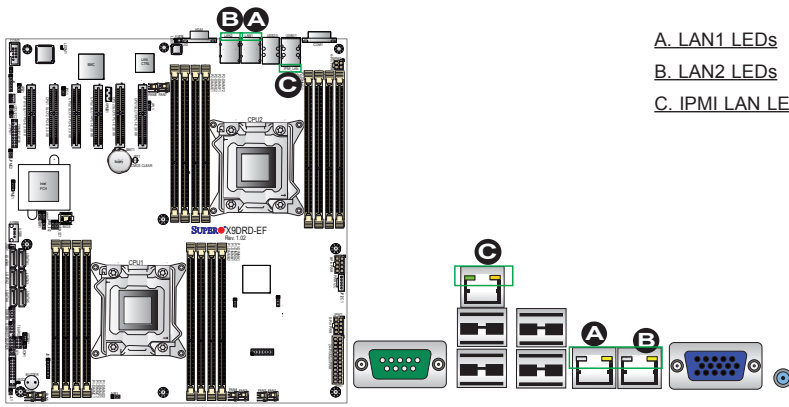
| GLAN Link Indicator LED Settings | |
|---|---|
| LED Color | Definition |
| Off | No Connection or 10 Mbps |
| Green | 100 Mbps |
| Amber | 1 Gbps |

### IPMI Dedicated LAN LEDs

In addition to LAN1/LAN2, an IPMI Dedicated LAN is also located on the I/O Backplane of the motherboard. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the tables at right for more information.




| IPMI LAN Link LED (Left) & Activity LED (Right) | | |
|---|---|---|
| | Color/State | Definition |
| Link (Left) | Green: Solid | 100 Mbps |
| Activity (Right) | Amber: Blinking | Active |




A. LAN1 LEDs
B. LAN2 LEDs
C. IPMI LAN LEDs

### Onboard Power LED

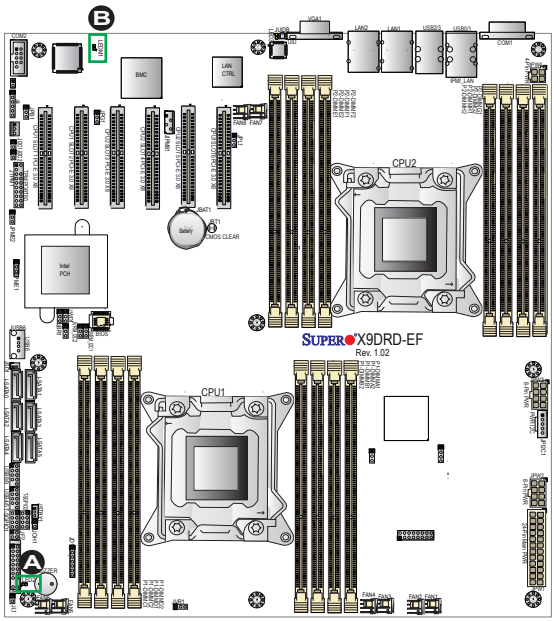
An Onboard Power LED is located at LED2 on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

| Onboard PWR LED Indicator LED States | |
|---|---|
| LED Color | Definition |
| Off | System Off (PWR cable not connected) |
| Green | System On |
| Green: Flashing Quickly | ACPI S1 State |

### BMC Heartbeat LED

A BMC Heartbeat LED is located at LEDM1 on the motherboard. When LEDM1 is blinking, BMC functions normally. See the table at right for more information.

| BMC Heartbeat LED States | |
|---|---|
| Color/State | Definition |
| Green: Blinking | BMC: Normal |



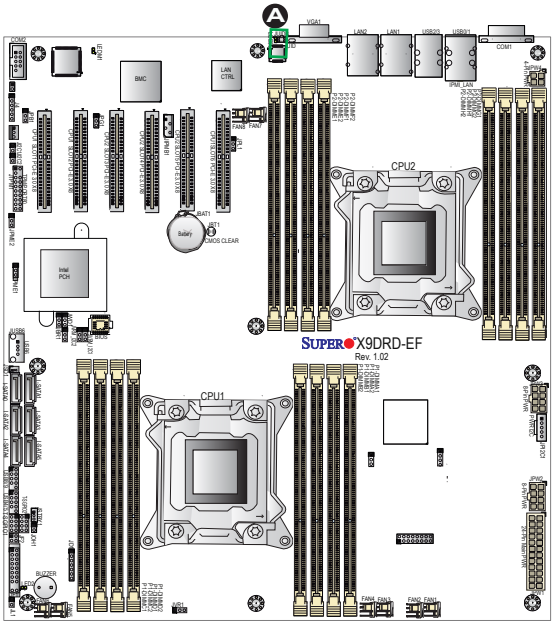

A. PWR LED

B. BMC LED

### Unit Identification Switch/LED

A Unit Identifier switch (UID) and a rear UID LED indicator (LED3) are located next to LAN ports on the back of the chassis. When the user pushes the rear UID switch, the rear UID LED (LED3) will be turned on. Push the UID switch again to turn off the LED indicator. The UID switch provides easy identification of a system unit that may be in need of service. See the tables on the right for more information. For more information on the UID switch and LED indications, refer to Page 2-18.

| UID LED Status | | |
|---|---|---|
| Color/State | OS | Status |
| Blue: On | Windows OS | Unit Identified |
| Blue: Blinking | Linux OS | Unit Identified |




A. UID LED

## 2-9 SATA Connections

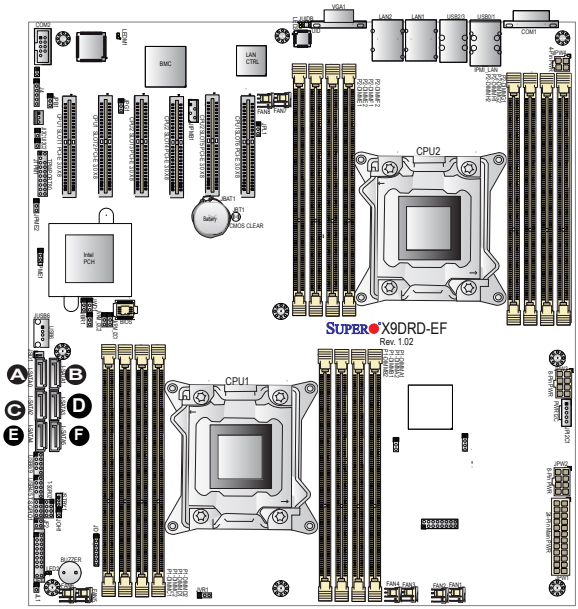
### Serial ATA Ports

There are six Serial ATA Ports (I-SATA0-I-SATA5) located on the motherboard, including two SATA 3.0 ports (I-SATA 0/1) and four SATA 2.0 ports (I-SATA 2-5). These ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

**SATA Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | Ground |
| 2 | TX_P |
| 3 | TX_N |
| 4 | Ground |
| 5 | RX_N |
| 6 | RX_P |
| 7 | Ground |

**Note:** For more information on SATA HostRAID configuration, please refer to the Intel SATA HostRAID User's Guide posted on our website @ http://www.supermicro.com..




A. I-SATA0
B. I-SATA1
C. I-SATA2
D. I-SATA3
E. I-SATA4
F. I-SATA5

# Chapter 3

# Troubleshooting

## 3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Note: Always disconnect the power cord before adding, changing or installing any hardware components.

### Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install CPU 1 first (making sure it is fully seated) and connect the front panel connectors to the motherboard.

### No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that the ATX power connectors are properly connected
3. Check that the 115V/230V switch on the power supply is properly set, if available.
4. Turn the power switch on and off to test the system, if applicable.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

### No Video

1. If the power is on, but you have no video, remove all the add-on cards and cables.

2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.

### System Boot Failure

If the system does not display POST or does not respond after the power is turned on, check the following:

1. Check for any error beep from the motherboard speaker.

- If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, try to turn on the system again with only one processor installed in CPU Socket#1. If there is still no error beep, replace the motherboard.

- If there are error beeps, clear the CMOS settings by unplugging the power cord and contracting both pads on the CMOS Clear Jumper (JBT1). (Refer to Section 2-7 in Chapter 2.)

2. Remove all components from the motherboard, especially the DIMM modules. Make sure that system power is on, and memory error beeps are activated.

3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this Chapter.

### Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 2-6 for details on recommended power supplies.

2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

## Memory Errors

When a No-Memory Beep Code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMM modules are properly and fully installed. (For memory compatibility, refer to the Memory Compatibility Chart posted on our website @ http://www.supermicro.com.)

2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM speed for all DIMMs in the system.

3. Make sure that you are using the correct type of Registered (RDIMM)/Reduced Load (LRDIMM) ECC or Unbuffered (UDIMM) ECC/Non-ECC DDR3 modules recommended by the manufacturer.

4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in Section 2-3 in Chapter 2.

6. Please follow the instructions given in the DIMM Population Tables listed in Section 2-3 to install your memory modules.

## When the System Becomes Unstable

***A. The system becomes unstable during or after OS installation***

When the system becomes unstable during or after OS installation, check the following:

1. CPU/BIOS support: Make sure that your CPU is supported, and you have the latest BIOS installed in your system.

2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.

   **Note**: Refer to the product page on our website http://www.supermicro.com for memory and CPU support and updates.

3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.

4. System cooling: Check system cooling to make sure that all heatsink fans, and CPU/system fans, etc., work properly. Check Hardware Monitoring set-

tings in the BIOS to make sure that the CPU and System temperatures are within the normal range. Also check the front panel Overheat LED, and make sure that the Overheat LED is not on.

5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Please refer to our website for more information on minimum power requirement.

6. Proper software support: Make sure that the correct drivers are used.

***B. The system becomes unstable before or during OS installation***

When the system becomes unstable before or during OS installation, check the following:

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as CD/DVD disc, CD/DVD-ROM.

2. Cable connection: Check to make sure that all cables are connected and working properly.

3. Using minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use minimum configuration (with a CPU and a memory module installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.

4. Identifying bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.

5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.

6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

## 3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com).

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- Motherboard model and PCB revision number
- BIOS release date/version (This can be seen on the initial display when your system first boots up.)
- System configuration

4. An example of a Technical Support form is on our website at (http://www.supermicro.com).

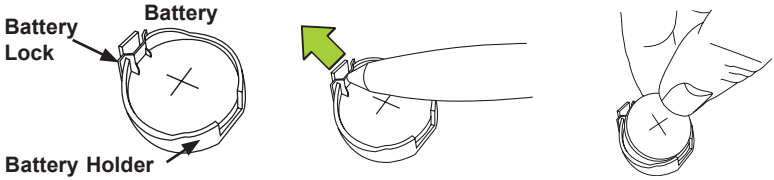
- Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com.

## 3-3 Battery Removal and Installation

### Battery Removal

To remove the onboard battery, follow the steps below:

1. Power off your system and unplug your power cable.
2. Locate the onboard battery as shown below.



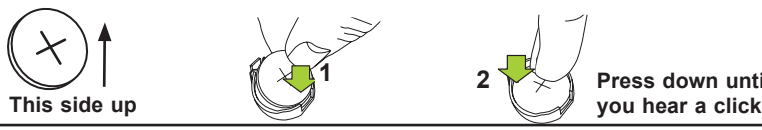

3. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.
4. Remove the battery.

### Proper Battery Disposal

**Warning!** Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

### Battery Installation

1. To install an onboard battery, follow the steps 1& 2 above and continue below:
2. Identify the battery's polarity. The positive (+) side should be facing up.



3. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

**Warning:** When replacing a battery, be sure to only replace it with the same type.

## 3-4 Frequently Asked Questions

**Question: What are the various types of memory that my motherboard can support?**

**Answer:** The motherboard supports Registered (RDIMM)/Load Reduced (LRDIMM) ECC or Unbuffered (UDIMM) ECC/Non-ECC DDR3 modules. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-3 in Chapter 2.

**Question: How do I update my BIOS?**

It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format AMI.bat filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot.

**Warning**: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure!)

**Note**: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair. For BIOS Recovery instructions, please refer to the AMI BIOS Recovery Instructions posted at http://www.supermicro.com.

**Question: What's on the CD that came with my motherboard?**

**Answer:** The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for the Windows OS, security and audio drivers.

**Question: How do I handle the used battery?**

**Answer:** Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly. (Refer to Section 3-3 on Page 3-6.)

## 3-5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning the motherboard to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package is mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, You can also request a RMA authorization online (http://www.supermicro.com).

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

# Chapter 4

# BIOS

## 4-1 Introduction

This chapter describes the AMI BIOS Setup utility for the X9DRD-EF. It also provides the instructions on how to navigate the AMI BIOS Setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

### Starting BIOS Setup Utility

To enter the AMI BIOS Setup utility screens, press the <Del> key while the system is booting up.

**Note**: In most cases, the <Del> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F3>, <F4>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for informational text. When an option is selected in the left frame, it is highlighted in white. Often informational text will accompany it.

**Note**: The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.

The AMI BIOS Setup utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

**Note 1**: Options printed in **Bold** are default settings.

**Note 2**: <F3> is used to load optimal default settings. <F4> is used to save the settings and exit the setup utility.

### How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Delete> at the appropriate time during system boot.

**Note**: For AMI UEFI BIOS Recovery, please refer to the UEFI BIOS Recovery User Guide posted @http://www.supermicro.com/support/manuals/.

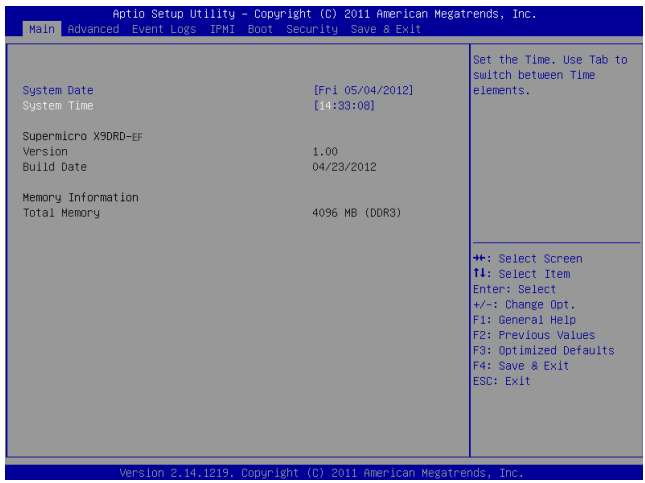
### Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

**Warning!** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall the manufacturer be liable for direct, indirect, special, incidental, or consequential damage arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is being updated to avoid possible boot failure.

## 4-2 Main Setup

When you first enter the AMI BIOS Setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Save & Exit
Set the Time. Use Tab to switch between Time elements.
System Date [Fri 05/04/2012]
System Time [14:33:08]
Supermicro X9DRD-EF
Version 1.00
Build Date 04/23/2012
Memory Information
Total Memory 4096 MB (DDR3)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

The AMI BIOS Main menu displays the following information:

**System Date/System Time**

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.).

**Supermicro X9DRD-EF**

**Version**

This item displays the SMC version of the BIOS ROM used in this system.

**Build Date**

This item displays the date that the BIOS Setup utility was built.

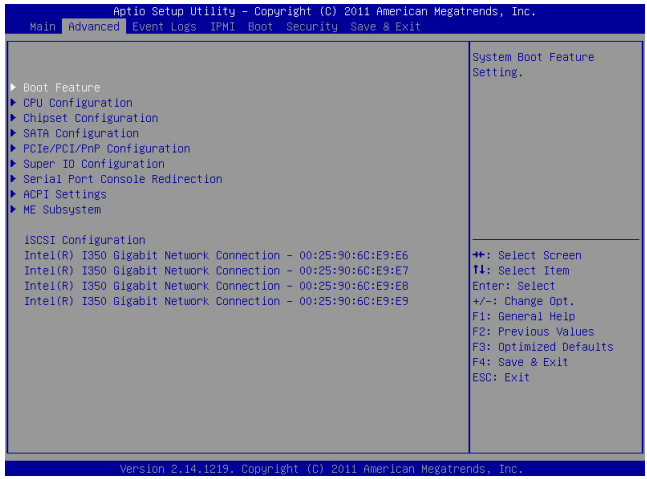
**Memory Information**

**Total Memory**

This displays the amount of memory that is available in the system.

## 4-3 Advanced Setup Configurations

Select the Advanced tab to access the following submenu items.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Save & Exit
Boot Feature
CPU Configuration
Chipset Configuration
SATA Configuration
PCIe/PCI/PnP Configuration
Super IO Configuration
Serial Port Console Redirection
ACPI Settings
ME Subsystem
iSCSI Configuration
Intel(R) I350 Gigabit Network Connection - 00:25:90:6C:E9:E6
Intel(R) I350 Gigabit Network Connection - 00:25:90:6C:E9:E7
Intel(R) I350 Gigabit Network Connection - 00:25:90:6C:E9:E8
Intel(R) I350 Gigabit Network Connection - 00:25:90:6C:E9:E9
System Boot Feature Setting.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

### ▶Boot Feature

#### Quiet Boot

This feature allows the user to select bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

#### AddOn ROM Display Mode

Use this item to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are Keep Current and **Force BIOS**.

#### Bootup Num-Lock

Use this feature to set the Power-on state for the Numlock key. The options are Off and **On**.

#### Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

#### Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19

at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

## Power Configuration

**Watch Dog Function**

If enabled, the Watch Dog timer will allow the system to automatically reboot when a non-recoverable error occurs that lasts for more than five minutes. The options are Enabled and **Disabled.**

**Power Button Function**

If this feature is set to Instant Off, the system will power off immediately as soon as the user presses the power button. If this feature is set to 4 Seconds Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant Off** and 4 Seconds Override.

**Restore on AC Power Loss**

Use this feature to set the power state after a power outage. Select Stay Off for the system power to remain off after a power loss. Select Power On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Stay Off, Power On, and **Last State**.

## ▶CPU Configuration

This submenu displays the information of the CPU as detected by the BIOS. It also allows the user to configure CPU settings.

### ▶Socket 1 CPU Information/Socket 2 CPU Information

This submenu displays the following information regarding the CPUs installed in Socket 1/ Socket 2.

- Type of CPU
- CPU Signature
- Microcode Patch
- CPU Stepping
- Maximum / Minimum CPU Speed

- Processor Cores
- Intel HT (Hyper-Threading) Technology
- Intel VT-x Technology
- Intel SMX Technology
- L1 Data Cache / L1 Code Cache
- L2 Cache
- L3 Cache

**CPU Speed**

This item displays the speed of the CPU installed in Socket 1/Socket 2.

**64-bit**

This item indicates if the CPU installed in Socket 1 or Socket 2 supports 64-bit technology.

**Clock Spread Spectrum**

Select Enable to enable Clock Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

**RTID (Record Types IDs)**

This feature displays the total number of Record Type IDs for local and remote pools. The options are **Optimal** and Alternate.

**Hyper-threading**

Select Enabled to support Intel Hyper-threading Technology to enhance CPU performance. The options are **Enabled** and Disabled.

**Active Processor Cores**

Set to Enabled to use a processor's second core and above. (Please refer to Intel's website for more information.) The options are **All,** 1, 2, 4, and 6.

**Limit CPUID Maximum**

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS).

**Execute-Disable Bit (Available if supported by the OS & the CPU)**

Select Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web sites for more information.)

**Intel® AES-NI**

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are **Enabled** and Disabled.

**MLC Streamer Prefetcher (Available when supported by the CPU)**

If set to Enabled, the MLC (mid-level cache) streamer prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

**MLC Spatial Prefetch (Available when supported by the CPU)**

If this feature is set to Disabled, The CPU prefetches the cache line for 64 bytes. If this feature is set to Enabled the CPU fetches both cache lines for 128 bytes as comprised. The options are Disabled and **Enabled**.

**DCU Streamer Prefetcher (Available when supported by the CPU)**

Select Enabled to support Data Cache Unit (DCU) prefetch of L1 data to speed up data accessing and processing in the DCU to enhance CPU performance. The options are Disabled and **Enabled**.

**DCU IP Prefetcher**

Select Enabled for DCU (Data Cache Unit) IP Prefetcher support, which will prefetch IP addresses to improve network connectivity and system performance. The options are **Enabled** and Disabled.

**Intel® Virtualization Technology (Available when supported by the CPU)**

Select Enabled to support Intel Virtualization Technology, which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled.



**Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's website for detailed information.)

## ▶ CPU Power Management Configuration

This submenu allows the user to configure the following CPU Power Management settings.

**Power Technology**

Select Energy Efficiency to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are Disabled, **Energy Efficient**, and Custom. If the option is set to Custom, the following items will display:

**EIST (Available when Power Technology is set to Custom)**

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disabled (GV3 Disabled), and **Enabled (GV3 Enabled)**. (**Note**: GV3 is Intel Speedstep support used on older platforms. Please refer to Intel's website for detailed information.)

**Turbo Mode (Available when Power Technology is set to Custom and EIST is set to Enabled)**

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

**C1E Support (Available when Power Technology is set to Custom)**

Select Enabled to enable Enhanced C1 Power State to boost system performance. The options are **Enabled** and Disabled.

**CPU C3 Report (Available when Power Technology is set to Custom)**

Select Enabled to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enabled and **Disabled.**

**CPU C6 Report (Available when Power Technology is set to Custom)**

Select Enabled to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are **Enabled** and Disabled.

**CPU C7 Report (Available when Power Technology is set to Custom)**

Select Enabled to allow the BIOS to report the CPU C7 State (ACPI C3) to the operating system. CPU C7 State is a processor-specific low C-State. The options are **Enabled** and Disabled.

**Package C-State limit (Available when Power Technology is set to Custom)**

This feature allows the user to set the limit on the C-State package register. The options are C0, C2, **C6,** and No Limit.

**Energy/Performance Bias**

Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency with maximum power saving). The fan speeds are controlled by the firmware management via IPMI 2.0. The options are Performance, **Balanced Performance**, Balanced Energy, and Energy Efficient.

**Factory Long Duration Power Limit**

This item displays the power limit (in watts) set by the manufacturer during which long duration power is maintained.

**Long Duration Power Limit**

This item displays the power limit (in watts) set by the user during which long duration power is maintained. The default setting is 0.

**Factory Long Duration Maintained**

This item displays the period of time (in seconds) set by the manufacturer during which long duration power is maintained.

**Long Duration Maintained**

This item displays the period of time (in seconds) during which long duration power is maintained. The default setting is 0.

**Recommended Short Duration Power**

This item displays the short duration power settings (in watts) recommended by the manufacturer.

**Short Duration Power Limit**

During Turbo Mode, the system may exceed the processors default power setting and exceed the Short Duration Power limit. By increasing this value, the processor can provide better performance for short duration. This item displays the time period during which short duration power is maintained. The default setting is 0.

## ▶Chipset Configuration

### ▶North Bridge

This feature allows the user to configure the settings for the Intel North Bridge.

### ▶Integrated IO Configuration

**Intel® VT-d**

Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enabled** and Disabled.

**Intel® I/OAT**

Select Enabled to enable Intel I/OAT (I/O Acceleration Technology), which significantly reduces CPU overhead by leveraging CPU architectural improvements and freeing the system resource for other tasks. The options are Disabled and **Enabled**.

**DCA Support**

When set to Enabled, this feature uses Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are **Enabled** and Disabled.

**IIO 1 PCIe Port Bifurcation Control**

This submenu configures the following IO PCIe Port Bifurcation Control settings for IIO 1 PCIe ports to determine how the available PCI-Express lanes to be distributed between the PCI-Exp. Root Ports.

**CPU1 Slot1 PCI-E 3.0 x8 Link Speed/ CPU1 Slot2 PCI-E 3.0 x8 Link Speed/ CPU1 Slot6 PCI-E 3.0 x8 Link Speed**

Select GEN1 for the device installed on the slot specified to support PCI-Exp Generation 1. Select GEN2 for the device installed on the slot specified to support PCI-Exp Generation 2. Select GEN3 for the device installed on the slot specified to support PCI-Exp Generation 3. The options are GEN1, GEN2, and **GEN3**.

**IIO 2 PCIe Port Bifurcation Control**

This submenu configures the following IO PCIe Port Bifurcation Control settings for IIO 2 PCIe ports to determine how the available PCI-Express lanes to be distributed between the PCI-Exp. Root ports.

**CPU2 Slot3 PCI-E 3.0 x8 Link Speed/CPU2 Slot4 PCI-E 3.0 x8 Link Speed/CPU2 Slot5 PCI-E 3.0 x8 Link Speed**

Select GEN1 for the device installed on the slot specified to support PCI-Exp Generation 1. Select GEN2 for the device installed on the slot specified to support PCI-Exp Generation 2. Select GEN3 for the device installed on the slot specified to support PCI-Exp Generation 3. The options are GEN1, GEN2**,** and **GEN3**.

## ▶QPI Configuration

**Current QPI Link**

This item displays the current status of the QPI Link.

**Current QPI Frequency**

This item displays the frequency of the QPI Link.

**Isoc**

Select Enabled to enable Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for virtualization technology. The options are Enabled and **Disabled**.

**QPI (Quick Path Interconnect) Link Speed Mode**

Use this feature to select data transfer speed for QPI Link connections. The options are Slow and **Fast**.

**QPI Link Frequency Select**

Use this feature to select the desired QPI frequency. The options are **Auto**, 6.4 GT/s, 7.2 GT/s, and 8.0 GT/s.

## ▶DIMM Configuration

This section displays the following DIMM information.

**Current Memory Mode**

This item displays the current memory mode.

**Current Memory Speed**

This item displays the current memory speed.

**Mirroring (Available when supported by the motherboard)**

Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

**Sparing (Available when supported by the motherboard)**

Memory sparing enhances system reliability, availability, and serviceability.

**▶DIMM Information**

**CPU Socket 1 DIMM Information, CPU Socket 2 DIMM Information**

The status of the memory modules detected by the BIOS will be displayed as detected by the BIOS.

**Memory Mode**

When Independent is selected, all DIMMs are available to the operating system. When Mirroring is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lock Step is selected, the motherboard uses two areas of memory to run the same set of operations in parallel. The options are **Independent**, Mirroring, and Lock Step.

**DRAM RAPL Mode**

RAPL (Running Average Power Limit) provides mechanisms to enforce power consumption limits on supported processors The options are Disabled, DRAM RAPL MODE0, and **DRAM RAPL MODE1**.

**DDR Speed**

Use this feature to force a DDR3 memory module to run at a frequency other than what is specified in the specification. The options are Force DDR3-800, Force DDR3-1066, Force DDR3-1333, Force DDR3-1600 and Force SPD, and **Auto**.

**Channel Interleaving**

This feature selects from the different channel interleaving methods. The options are **Auto**, 1 Way, 2 Way, 3, Way, and 4 Way.

**Rank Interleaving**

This feature allows the user to select a rank memory interleaving method. The options are **Auto**, 1 Way, 2 Way, 4, Way, and 8 Way.

**Patrol Scrub**

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, the IO hub will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are **Enabled** and Disabled.

**Demand Scrub**

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and **Disabled**.

**Data Scrambling**

Select Enabled to enable data scrambling to ensure data security and integrity. The options are Disabled and **Enabled**.

**Device Tagging**

Select Enabled to support device tagging. The options are **Disabled** and Enabled.

**Thermal Throttling**

Throttling improves reliability and reduces power consumption in the processor via automatic voltage control during processor idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

## ▶South Bridge Configuration

This feature allows the user to configure the settings for the Intel PCH chip.

**PCH Information**

This feature displays the following PCH information.

**Name**: This item displays the name of the PCH chip.

**Stepping**: This item displays the status of the PCH stepping.

**USB Devices**: This item displays the USB devices detected by the BIOS.

**All USB Devices**

This feature enables all USB ports/devices. The options are Disabled and **Enabled**. (If set to Enabled, EHCI Controller 1 and Controller 2 will appear.)

**EHCI Controller 1/EHCI Controller 2 (Available when All USB Devices is set to Enabled)**

Select Enabled to enable EHCI (Enhanced Host Controller Interface) Controller 1 or Controller 2. The options are Disabled and **Enabled**.

**Legacy USB Support (Available when USB Functions is not Disabled)**

Select Enabled to support legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disabled to have USB devices available for EFI (Extensive Firmware Interface) applications only. The settings are **Enabled** Disabled, and Auto.

**Port 60/64 Emulation**

Select Enabled to enable I/O port 60h/64h emulation support for the legacy USB keyboard so that it can be fully supported by the operating systems that does not recognize a USB device. The options are Disabled and **Enabled**.

**EHCI Hand-Off**

This item is for operating systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When enabled, EHCI ownership change will be claimed by the EHCI driver. The options are **Disabled** and Enabled.

## ▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of IDE or SATA devices and displays the following items.

**SATA Port0~SATA Port5**: The AMI BIOS displays the status of each SATA port as detected by the BIOS.

**SATA Mode**

Use this feature to configure SATA mode for a selected SATA port. The options are Disabled, IDE Mode, **AHCI Mode** and RAID Mode. The following are displayed depending on your selection:

**IDE Mode**

The following items are displayed when IDE Mode is selected:

**Serial-ATA (SATA) Controller 0~1**

Use this feature to activate or deactivate the SATA controller, and set the compatibility mode. The options for SATA Controller 0 are Disabled, Enhanced, and **Compatible**. The options for SATA Controller 1 are Disabled and **Enhanced**.

**AHCI Mode**

The following items are displayed when the AHCI Mode is selected.

**Aggressive Link Power Management**

When Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link in a low power mode during extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Enabled** and Disabled.

**Port 0~5 Hot Plug**

Select Enabled to enable hot-plug support for a particular port, which will allow the user to change a hardware component or device without shutting down the system. The options are **Enabled** and Disabled.

**Staggered Spin Up**

Select Enabled to enable Staggered Spin-up support to prevent excessive power consumption caused by multiple HDDs spinning-up simultaneously. The options are Enabled and **Disabled**.

**RAID Mode**

The following items are displayed when RAID Mode is selected:

**Port 0~5 Hot Plug**

Select Enabled to enable hot-plug support for the particular port. The options are **Enabled** and Disabled.

## ▶PCIe/PCI/PnP Configuration

**Storage Add-on Card OpROM Policy**

Use this feature to select the Option ROM to boot the system when there are multiple Option ROMs available in the system. The options are **Legacy ROM** and EFI Compatible ROM.

**PCI Latency Timer**

Use this feature to set the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

**Above 4G Decoding (Available if the system supports 64-bit PCI decoding)**

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and **Disabled**.

**PERR# Generation**

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

**SERR# Generation**

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

**Maximum Payload**

Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes and 256 Bytes.

**Maximum Read Request**

Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

**ASPM Support**

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0s to force all PCI-E links to operate at L0s state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0s, and Auto.

⚠ **Warning**: Enabling ASPM support may cause some PCI-E devices to fail!

**CPU1 Slot 1 PCI-E 3.0 x8 OPROM, CPU1 Slot 2 PCI-E 3.0 x8 OPROM, CPU2 Slot 3 PCI-E 3.0 x8 OPROM, CPU2 Slot 4 PCI-E 3.0 x8 OPROM, CPU2 Slot 5 PCI-E 3.0 x8 OPROM, CPU1 Slot 6 PCI-E 3.0 x 8 OPROM**

Select Enabled to enable Option ROM support to boot the computer using a device installed on the slot specified above. The options are **Enabled** and Disabled.

**Onboard LAN Option ROM Select**

Select iSCSI to use the iSCSI Option ROM to boot the computer using a network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a network device. The options are **PXE** and iSCSI.

**Load Onboard LAN1~LAN4 Option ROM**

Select Enabled to enable the onboard LAN1 Option ROM~LAN4 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is **Enabled**, and the default setting for LAN2~LAN4 Option ROM is **Disabled**.

**VGA Priority**

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard**, and Offboard.

**Network Stack**

Select Enabled enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and **Disabled**.

## ▶Super IO Configuration

**Super IO Chip:** This item displays the Super IO chip used in the motherboard.

## ▶Serial Port 1 Configuration

**Serial Port**

Select Enabled to enable serial port 1. The options are **Enabled** and Disabled.

**Device Settings**

This item displays the settings of Serial Port 1.

**Change Settings**

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h, and IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12.

**Device Mode**

Use this feature to select the desired mode for a serial port specified. The options are **Normal** and High Speed.

## ▶Serial Port 2 Configuration

**Serial Port**

Select Enabled to enable serial port 2. The options are **Enabled** and Disabled.

**Device Settings**

This item displays the settings of Serial Port 2.

**Change Settings**

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; and IO=2E8h, and IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12.

**Device Mode**

Use this feature to select the desired mode for a serial port specified. The options are **Normal** and High Speed.

**Serial Port 2 Attribute**

Use this feature to select the attribute for this serial port. The options are **SOL** (Serial Over LAN), and COM.

## ▶Serial Port Console Redirection

**COM1, COM2/SOL**

These two submenus allow the user to configure the following Console Redirection settings for a COM Port specified by the user.

**Console Redirection**

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled. The default setting for COM1 is **Disabled**, and for COM2/SOL is **Enabled**.

### ▶Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

**Terminal Type**

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

**Bits Per second**

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

**Data Bits**

Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and **8 Bits**.

**Parity**

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

**Stop Bits**

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

**Flow Control**

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

**VT-UTF8 Combo Key Support**

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled**.**

**Recorder Mode**

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

**Resolution 100x31**

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

**Legacy OS Redirection Resolution**

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are 80x24 and **80x25**.

**Putty KeyPad**

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SC0, ESCN, and VT400.

**Redirection After BIOS POST**

Use this feature to enable or disable legacy console redirection after BIOS POST. When set to Bootloader, legacy console redirection is disabled before booting the OS. When set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and Bootloader.

**Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)**

The submenu allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

**Console Redirection (for EMS)**

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and **Disabled**.

## ▶Console Redirection Settings (for EMS)

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

**Out-of-Band Management Port**

The feature selects a serial port used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote server. The options are **COM1** and COM2/SOL.

**Terminal Type**

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

**Bits Per Second**

This item sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and **115200** (bits per second).

**Flow Control**

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None,** Hardware RTS/CTS, and Software Xon/Xoff.

**Data Bits, Parity, Stop Bits**

The status of these features is displayed.

## ▶ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

**ACPI Sleep State**

Use this feature to select the ACPI State when the system is in sleep mode. Select S1 (CPU_Stop_Clock) to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed. Select Suspend Disabled to use power-reduced mode. Power will only be supplied to limited components (such as RAMs) to maintain the most critical functions of the system. The options are Suspend Disabled and **S1 (CPU_Stop_Clock)**.

**NUMA (NON-Uniform Memory Access)**

This feature enables the Non-Uniform Memory Access ACPI support. The options are **Enabled** and Disabled.

**High Precision Event Timer**

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback, reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

## ▶Trusted Computing (Available when a TPM device is detected by the BIOS)

**Configuration**

**TPM Support**

Select Enabled on this item and enable the TPM jumper on the motherboard to enable TPM support to improve data integrity and network security. The options are **Enabled** and Disabled.

**TPM State**

Select Enabled to enable TPM security settings to improve data integrity and network security. The options are Disabled and **Enabled**.

**Pending Operation**

Use this item to schedule an operation for the security device. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

**Note:** During restart, the computer will reboot in order to execute the pending operation and change the state of the security device.

**Current Status Information:** This item displays the information regarding the current TPM status.

**TPM Enable Status**

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

**TPM Active Status**

This item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

**TPM Owner Status**

This item displays the status of TPM Ownership.

## ▶Intel TXT (LT-SX) Configuration

**Intel TXT (LT-SX) Hardware Support**

This feature indicates if the following hardware components support the Intel Trusted Execution Technology.

**CPU**: TXT (Trusted Execution Technology) Feature

**Chipset**: TXT (Trusted Execution Technology) Feature

**Intel TXT (LT-SX) Configuration**

This feature displays the following TXT configuration setting.

**TXT (LT-SX) Support:** This item indicates if the Intel TXT support is enabled or disabled. The default setting is **Disabled**.

**Intel TXT (LT-SX) Dependencies**

This feature displays the features that need to be enabled for the Intel Trusted Execution Technology to work properly in the system.

**VT-d Support**: Intel Virtualization Technology with Direct I/O support

**VT Support**: Intel Virtualization Technology support

**TPM Support**: Trusted Platform support

**TPM State**: Trusted Platform state

## ▶ME Subsystem

This feature displays the following ME Subsystem Configuration settings.

- **ME BIOS Interface Version**
- **ME Version**

**iSCSI Configuration:** This item displays iSCSI configuration information:

**iSCSI Initiator Name**

This item displays the name of the iSCSI Initiator, which is a unique name used in the world. The name must use IQN format. The following actions can also be performed:

- Add an Attempt
- Delete Attempts
  - Commit/Discard Changes and Exit
- Change Attempt Order
  - Commit/Discard Changes and Exit

**Intel® Ethernet Controller I350 Gigabit Network Connection**: These items display the following information on the Intel I350 Gigabit network connections.

## ▶NIC Configuration

**Link Speed**

Use this feature to change the link speed and duplex for the current port. The options are **AutoNeg**, 10Mbps Half, 10Mbps Full, 100Mbps Half, and 100Mbps full.

**Wake on LAN**

Select enabled to wake the system with a magic packet. The options are **Enabled** and Disabled.

**Blink LEDs**

This feature allows the user to specify the duration for LEDs to blink. The range is from 0 - 15 seconds. The default setting is **0**.

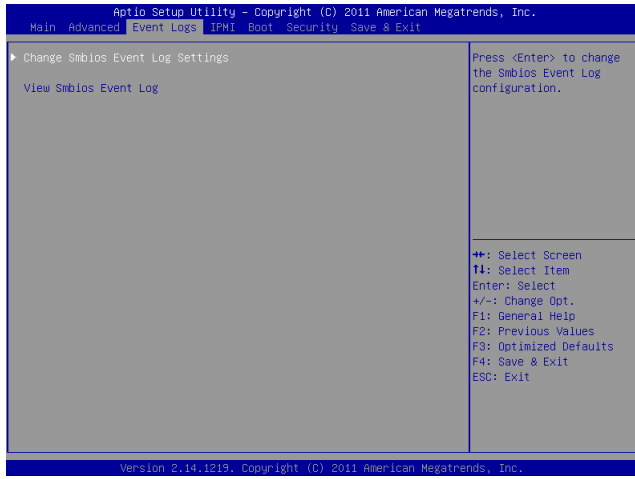
**PORT CONFIGURATION INFORMATION**

This section displays the following port information:

- UEFI Driver
- Adapter PBA
- Chip Type
- PCI Device ID
- PCI Bus:Device:Function
- Link Status
- Factory MAC Address / Alternate MAC Address

## 4-4 Event Logs

Select the Event Logs tab to access the following submenu items.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Save & Exit
Change Smbios Event Log Settings
View Smbios Event Log
Press <Enter> to change the Smbios Event Log configuration.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

### ▶Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

#### Enabling/Disabling Options

#### SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are **Enabled** and Disabled.

#### Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are **Enabled** and Disabled.

#### Memory Correctable Error Threshold

This feature allows the user to enter the threshold value for correctable memory errors. The default setting is **10**.

#### PCI Error Logging Support

Select Enabled to support error event logging for PCI slots. The options are Enabled and **Disabled**.

**Erasing Settings**

**Erase Event Log**

Select Enabled to erase the SMBIOS (System Management BIOS) Event Log, which is completed before a event logging is initialized upon system reboot. The options are **No,** Yes, Next reset, and Yes, Every reset.

**When Log is Full**

Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

**SMBIOS Event Log Standard Settings**

**Log System Boot Event**

Select Enabled to log system boot events. The options are **Disabled** and Enabled.

**MECI (Multiple Event Count Increment)**

Enter the increment value for the multiple event counter. Enter a number from 1 to 255. The default setting is **1**.

**METW (Multiple Event Count Time Window)**

This item allows the user to decide how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number from 0 to 99. The default setting is **60**.

**View SMBIOS Event Log**

This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log.

Date/Time/Error Code/Severity

## 4-5 IPMI

Select the IPMI (Intelligent Platform Management Interface) tab to access the following submenu items.

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Save & Exit
IPMI Firmware Revision 1.50
IPMI STATUS Working
System Event Log
BMC network configuration
Configure BMC network parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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### IPMI Firmware Revision

This item indicates the IPMI firmware revision used in your system.

### IPMI Status

This item indicates the status of the IPMI firmware installed in your system.

## ▶System Event Log

### Enabling/Disabling Options

### SEL Components

Select Enabled for all system event logging at bootup. The options are **Enabled** and Disabled.

### Erasing Settings

### Erase SEL

Select Yes, On next reset to erase all system event logs upon next system reboot. Select Yes, On every reset to erase all system event logs upon each system reboot. Select No to keep all system event logs after each system reboot. The options are **No,** Yes, On next reset, and Yes, On every reset.

**When SEL is Full**

This feature allows the user to decide what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

**Custom EFI Logging Options**

**Log EFI Status Codes**

Select Enabled to log EFI (Extensible Firmware Interface) Status Codes, Error Codes or Progress Codes. The options are **Enabled** and Disabled.

**Note**: After making changes on a setting, be sure to reboot the system for the changes to take effect.

## ▶BMC Network Configuration

**LAN Channel 1**: This feature allows the user to configure the settings for LAN1 Port.

**Update IPMI LAN Configuration**

This feature allows the BIOS to implement any IP/MAC address changes at the next system boot. If the option is set to Yes, any changes made to the settings below will take effect when the system is rebooted. The options are **No** and Yes.

**Configuration Address Source**

This feature allows the user to select the source of the IP address for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options are **DHCP** and Static. The following items are assigned IP addresses automatically if DHCP is selected, or can be configured manually if Static is selected.

**Station IP Address**

This item displays the Station IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

**Subnet Mask**

This item displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.

**Station MAC Address**

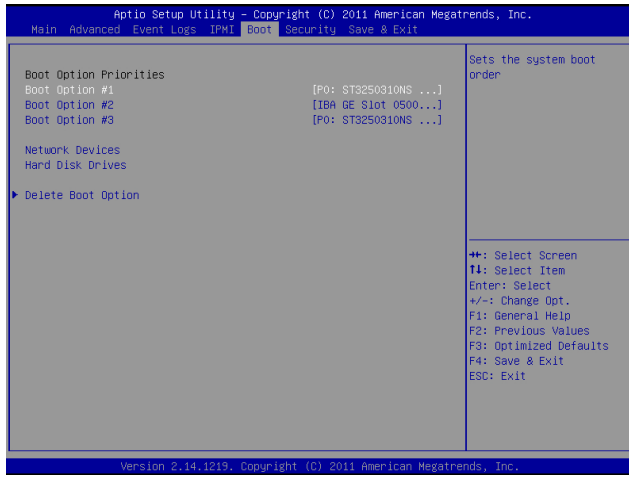
This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

### Gateway IP Address

This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

## 4-6 Boot

This submenu allows the user to configure the following boot settings for the system.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Save & Exit
Boot Option Priorities
Boot Option #1 [P0: ST3250310NS ...]
Boot Option #2 [IBA GE Slot 0500...]
Boot Option #3 [P0: ST3250310NS ...]
Network Devices
Hard Disk Drives
Delete Boot Option
Sets the system boot order
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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### Boot Option Priorities

### Boot Option #1, Boot Option #2, Boot Option #3, etc.

Use this feature to specify the sequence of boot device priority.

### Network Devices, Hard Disk Drives

Use these options to set the order of the legacy network and hard drive devices detected by the motherboard.

### ▶Delete Boot Option

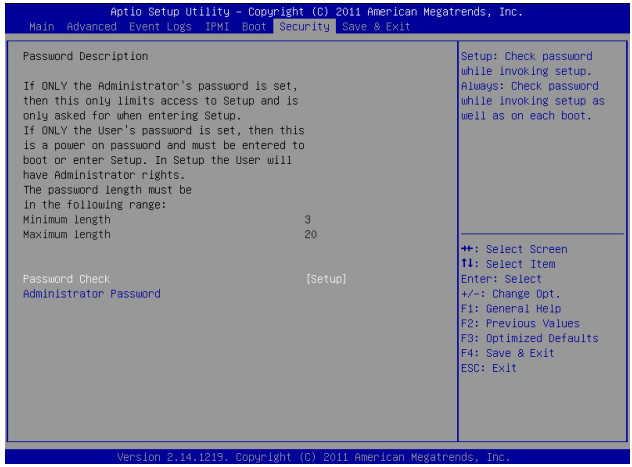
This feature allows the user to select a EFI boot device to delete from the boot priority list.

### Delete Boot Option

Select the desired boot device to delete.

# 4-7 Security

This menu allows the user to configure the following security settings for the system.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Password Check [Setup]
Administrator Password
Setup: Check password while invoking setup. Always: Check password while invoking setup as well as on each boot.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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### Password Check

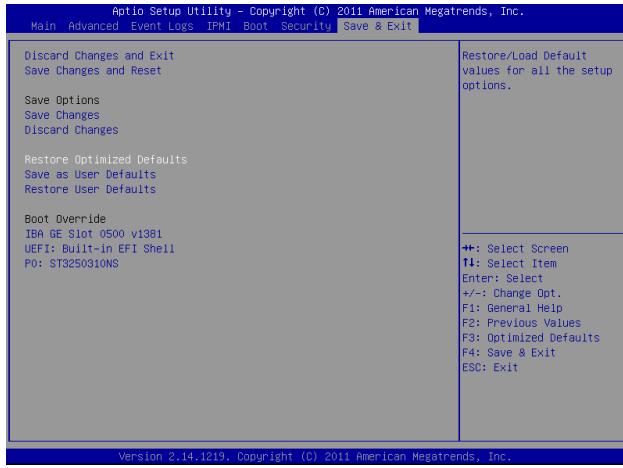
Use this feature to determine when a password entry is required. Select Setup to require the password only when entering setup. Select Always to require the password when entering setup and on each boot. The options are **Setup** and Always.

### Administrator Password

Use this feature to set the Administrator Password which is required to enter the BIOS setup utility. The length of the password should be from 3 to 20 characters long.

## 4-8 Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Event Logs IPMI Boot Security Save & Exit
Discard Changes and Exit
Save Changes and Reset
Save Options
Save Changes
Discard Changes
Restore Optimized Defaults
Save as User Defaults
Restore User Defaults
Boot Override
IBA GE Slot 0500 v1381
UEFI: Built-in EFI Shell
P0: ST3250310NS
Restore/Load Default values for all the setup options.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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### Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.

### Save Changes and Reset

When you have completed the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect. Select Save Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.

### Save Options

### Save Changes

Select this option and press <Enter> to save all changes you've done so far and return to the AMI BIOS utility Program. When the dialog box appears, asking you if you want to save configuration, select **Yes** to save the changes, or select No to return to the BIOS without making changes.

**Discard Changes**

Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, select **Yes** to load the values previous saved, or select No to keep the changes you've made so far.

**Restore Optimized Defaults**

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load optimized defaults, select **Yes** to load the optimized default settings, or select No to abandon optimized defaults.

**Save as User Defaults**

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, select **Yes** to save the current values as user's default settings, or select No to keep the defaults previously saved as the user's defaults.

**Restore User Defaults**

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, select **Yes** to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.

**Boot Override**

This feature allows the user to override the Boot Option Priorities setting in the Boot menu, and instead boot the system with one of the listed devices. This is a one-time override.

# Appendix A

# BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed at each system boot, errors may occur.

**Non-fatal errors** are those which, in most cases, allow the system to continue to boot. The error messages normally appear on the screen.

**Fatal errors** will not allow the system to continue with bootup procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

## A-1 BIOS Error Beep Codes

| BIOS Error Beep Codes | | |
|---|---|---|
| **Beep Code/LED** | **Error Message** | **Description** |
| 1 beep | Refresh | Ready to boot |
| 5 short beeps + 1 long beep | Memory error | No memory detected in the system |
| 5 beeps | No Con-In or No Con-Out devices | Con-In: USB or PS/2 keyboard, PCI or Serial Console Redirection, IPMI KVM or SOL<br><br>Con-Out: Video Controller, PCI or Serial Console Redirection, IPMI SOL |
| | | |
| **X9 IPMI Error Codes** | | |
| 1 Continuous Beep | System OH | System Overheat |

# Notes

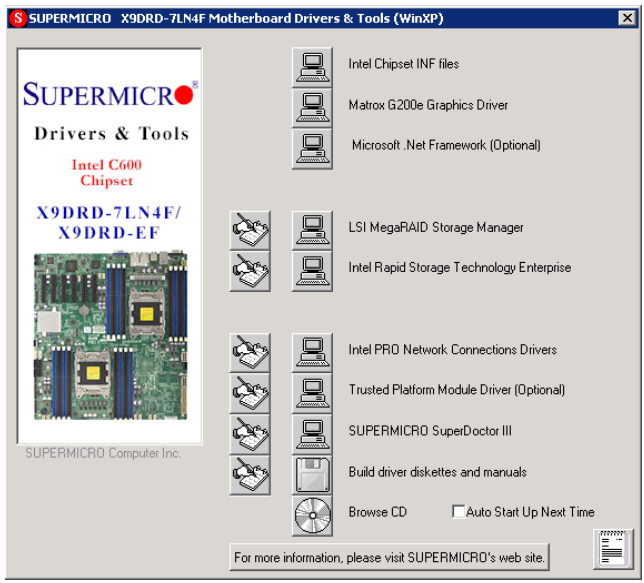
# Appendix B

# Software Installation Instructions

## B-1 Installing Software Programs

After you've installed the operating system, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these programs, click the icons to the right of these items.

**Note:** To install the Windows OS, please refer to the instructions posted on our website at http://www.supermicro.com/support/manuals/.


SUPERMICRO X9DRD-7LN4F Motherboard Drivers & Tools (WinXP)
SUPERMICRO
Drivers & Tools
Intel C600 Chipset
X9DRD-7LN4F/ X9DRD-EF
SUPERMICRO Computer Inc.
Intel Chipset INF files
Matrox G200e Graphics Driver
Microsoft .Net Framework (Optional)
LSI MegaRAID Storage Manager
Intel Rapid Storage Technology Enterprise
Intel PRO Network Connections Drivers
Trusted Platform Module Driver (Optional)
SUPERMICRO SuperDoctor III
Build driver diskettes and manuals
Browse CD
Auto Start Up Next Time
For more information, please visit SUPERMICRO's web site.

**Driver/Tool Installation Display Screen**

**Note 1**. Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item (from top to the bottom) one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

**Note 2**. When making a storage driver diskette by booting into a Driver CD, please set the SATA Configuration to "Compatible Mode" and configure SATA as IDE in the BIOS Setup. After making the driver diskette, be sure to change the SATA settings back to your original settings.

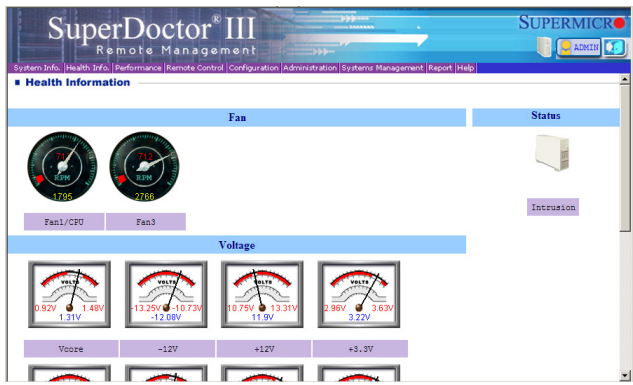
## B-2 Configuring SuperDoctor III (For Windows OS Only)

The SuperDoctor III program is a Web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The SuperDoctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the SuperDoctor III interface.

**Note**: 1 The default user name and password are ADMIN.

**Note 2:** In the Windows OS environment, the SuperDoctor III settings take precedence over the BIOS settings. When first installed, SuperDoctor III adopts the temperature threshold settings previously set in BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in BIOS.

**SuperDoctor III Interface Display Screen-I (Health Information)**



**SuperDoctor III Interface Display Screen-II (Remote Control)**

SuperDoctor® III
Remote Management
SUPERMICRO
ADMIN
System Info. | Health Info. | Performance | Remote Control | Configuration | Administration | Systems Management | Report | Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Graceful power control (cancelable)
Supero Doctor III allows a user to inform the OS to reboot or shut down the system within 30 seconds. On the system console, a pop-up window will appear with a message telling the local user to save his working files. Before the system reboots or shuts down, it's allowed to cancel the action either locally or remotely.
Power control (noncancelable)
Supero Doctor III allows a user to inform the OS to reboot or shut down the system right away. The system will reboot or shut down without any warning messages. It's not allowed to cancel the action.

**Note**: SD III software and the user's guide can be downloaded from our website at: http://www.supermicro.com/products/accessories/software/SuperDoctorIII.cfm. For Linux, we will still recommend that you use SuperDoctor II.

# Notes

(Disclaimer Continued)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.